Sobre México. Temas de Economía. Nueva Época, año 1, núm. 1, enero-junio 2020, pp. 79-125

Growth and inclusion trajectories of Colombian functional territories

Trayectorias de crecimiento e inclusión de los territorios funcionales colombianos

Leopoldo Fergusson
Universidad de los Andes, Colombia. lfergusson@uniandes.edu.co
Tatiana Hiller
Universidad de los Andes, Colombia. t.hiller274@uniandes.edu.co
Ana María Ibáñez
Universidad de los Andes, Colombia. aibanez@uniandes.edu.co

We acknowledge support from the International Development Research Centre (IDRC) through its program "Transformando Territorios", in coordination with the Centro Latinoamericano para el Desarrollo Rural (Rimisp).

Abstract

We describe the patterns of economic growth and social progress in Colombian "functional territories". Unlike political/administrative divisions that emerge at least partly for historical reasons unrelated to economic interactions, functional territories reflect the patterns of spatial agglomeration and economic interactions in a territory. Using a novel definition of functional territories, our analysis reveals significant fragmentation of economic interactions: close to 66% of municipalities (holding about 20% of the country's population) have no significant links to neighboring areas. A set of comparatively more (but still only partially) integrated and more populous municipalities have stronger links between them. This "rural-urban" space holds just around 31% of total population. The rest of Colombians are in "urban" or "Metropolitan" highly-populated and more integrated clusters. We describe these territories along two dimensions: economic growth or "dynamism" and progress in social indicators or "inclusion". To do so we propose a simple conceptual framework that organizes the diverse inputs that might help boost these outcomes. Larger and more urbanized agglomerations exhibit visible advantages in these inputs. Moreover, long-run institutional determinants best help differentiate territories. Consistent with this, larger and more urbanized agglomerations have better outcomes, especially when measuring economic activity. Also, more dynamic places tend to be the more inclusive ones, even though recent improvements in dynamism do not correlate with improvements in inclusion.

Keywords: Growth; inclusion; rural-urban territories.

Resumen

Describimos los patrones de crecimiento económico y progreso social en los "territorios funcionales" colombianos. En contraste con las divisiones políticas y administrativas que emergen en parte por razones históricas no relacionadas con las interacciones económicas, los territorios funcionales reflejan los patrones de aglomeración espacial y las interacciones económicas en un territorio. Usando una nueva definición de territorios funcionales nuestro análisis revela una fragmentación notoria en las interacciones económicas: cerca del 66% de los municipios (con 20% de la población del país) no tienen vínculos importantes con sus áreas vecinas. Un conjunto relativamente más (pero aún muy parcialmente) integrado de municipios con mayor población tienen mayores vínculos entre ellos. Este espacio "rural-urbano" tiene solo el 31% de toda la población. El resto de colombianos están en zonas "urbanas" o "metropolitanas" de aglomeraciones más pobladas y conectadas. Describimos estos territorios en dos dimensiones: crecimiento económico o "dinamismo" y progreso social o "inclusión". Para ello, proponemos un marco conceptual que organiza los insumos que pueden mejorar estos resultados. Las aglomeraciones más grandes y urbanizadas tienen ventajas visibles en estos insumos. Además, los determinantes de largo plazo son los que mejor ayudan a distinguir entre territorios. Consistente con esto, los territorios más grandes y urbanizados tienen mejores resultados, sobre todo en actividad económica. También, los lugares más dinámicos tienden a ser los más incluyentes.

Palabras clave: Crecimiento; inclusión; territorios rurales-urbanos; vínculos urbanos-rurales.

JEL: R11; O18; O10.

Fecha de recepción: 07 de junio de 2019

Fecha de aceptación: 26 de noviembre de 2019

1. Introduction

Most analyses of territorial economic performance are based on administrative units as the basic level of analysis. While there are obvious advantages and motivations for this (data is typically collected at such level, government agencies and their responsibilities are typically organized along such administrative lines), there are also significant limitations. Most importantly, economic interactions do not respect political boundaries. Thus, much of the economic processes and underlying causal mechanisms determining different economic trajectories can be missed when focusing on administrative boundaries. As a result, these boundaries may be inappropriate when devising policies since interdependencies are missed, including rural-urban linkages that are place-specific and therefore may demand place-based strategies and policies (Storper, 1997; Barca, 2010; Tomaney et al., 2011). For this reason, several countries (especially in the developed world) have increasingly attempted to not only define and analyze "functional territories" (OECD, 2002), but to use them as a basis for policy formulation. Unlike political/administrative divisions that emerge at least partly from historical reasons unrelated to economic interactions, functional territories should better reflect the patterns of spatial agglomeration and economic interactions in a territory.

This paper is motivated by three key questions concerning functional territories in the context of Colombia. First, what are these territories (i.e. how do they look)? Second, why do some territories grow and others not? And finally, why do some of them achieve better social indicators than others? To tackle the first question, we offer a definition of functional territories in Colombia drawing from Berdegué et al., (2017). The definition recognizes that a key ingredient shaping these set of interactions is the expansion of urban activities beyond urban agglomerations into rural areas, as well as the set of linkages that often exist between these areas. We describe these territories along key measures of two dimensions of performance (and their interaction): economic growth and economic inclusion. Next, we offer a first approximation to the second and third questions by evaluating the potentially relevant determinants of each of these dimensions. The analysis is descriptive, offering a detailed examination of the determinants that appear to be more or less robustly correlated with economic surplus and social progress, yet we avoid pushing a causal interpretation of our findings.[1]

[1] We will refer to economic growth and dynamism interchangeably in what follows when focusing on proxies for the amount of economic surplus, and we will use the terms economic inclusion and social progress when referring to improvements in living conditions of the more disadvantaged groups in society, levels of economic inequality, and the like.

Our main findings can be summarized as follows. On the spatial organization of functional territories in Colombia, we show that there are still many strictly rural municipalities (close to 66% of a total of 1,121 municipalities) that represent a non-negligible share of the population (close to 20%), and have quite limited links to neighboring areas. A set of comparatively more integrated and more populous municipalities have stronger links between them and comprise the rural-urban space. However, these municipalities still conform functional territories of just a few municipalities (at most 3.7 on average when looking at those with the largest agglomerations) and add up to just around 31% of the total population. The remaining population is in the urban or Metropolitan categories, the former integrating 3 territories of 19 municipalities with 5% of Colombians and the latter consisting of 5 areas of 71 municipalities with 40% of the total population.

Our examination of the set of inputs that these territories conceivably need to achieve economic growth and social inclusion reveals that larger and more urbanized agglomerations exhibit important advantages in geography, human capital, economic institutions, violence, and long-run determinants. Moreover, long-run institutional determinants best help differentiate the types of territories. When looking at recent short-run changes, no transformation in the essential inputs for economic dynamism and inclusion seem to favor the rural territories or the smaller rural-urban agglomerations.

In line with the findings for the required inputs, larger and more urbanized agglomerations are on average more dynamic and inclusive than smaller rural-urban and strictly urban territories. This stratification is particularly clear in dynamism, and there is more variation in social inclusion. Also, more dynamic places tend to be the more inclusive ones, but improvements in dynamism do not correlate with improvements in inclusion. Thus, though over the long run these two dimensions of performance do seem to bear some connection to each other, the short-run experience (from 2005 to 2010) shows them taking unconnected paths. Relatedly, even when metropolitan, urban, and the larger rural-urban are more inclusive and dynamic on average, they have not shown such clear dominance when it comes to improvements in economic outcomes. That said, although they have not had such economic momentum, at least they have achieved gains in inclusion, which may open the road for sustainable economic achievements. The very small territories are a cause for concern however, since a little over one-fifth of the smaller rural-urban territories and of the strictly rural ones have had a weak evolution of their economic dynamism and inclusion indices. In line with all of this, while there

is some evidence for conditional convergence in economic growth and inclusion indicators, the rate of convergence is not particularly strong.

We unpack the potential sources of success in economic growth and inclusion by examining the correlation between these dimensions of performance (both its level and change) with specific inputs. Several correlate intuitively with performance. Notably, the set of geographic determinants, particularly access to markets and proximity to main cities, correlate with better performance. An index of open government is very significantly and positively correlated with good outcomes in the long-run (that is, with the levels of the indices), whereas the informality of property rights also significantly (and negatively, in this case) correlate with performance. High levels and increases in violence are typically predictors of poor performance. Finally, increases in corrupt or clientelistic votes is correlated with poorer economic dynamism performance. In other cases, the patterns are less coherent. For example, when looking at the longer-run results of existing levels of dynamism and inclusion, some educational outcomes are higher in places that perform better, while human capital improvements do not correlate with increased economic activity or inclusion, casting doubts on the extent to which human capital has been a successful proximate determinant of these dimensions of performance. Our (admittedly broad) measures of economic policies are not consistently correlated with performance either.

Several papers have both described the persistency of regional inequality in Colombia along meaningful economic dimensions, and attempted to explore its underlying causes (see, for example, Galvis & Roca, 2010; Corts & Vargas, 2012; Gamboa & Londoño, 2014; Bonet-Morón & Ayala-García, 2016; Coscia et al., 2017; Fergusson et al., 2017). As noted, unlike the preponderance of the literature, we do not use the (readily available) administrative divisions as the unit of analysis. Instead, we use functional territories that incorporate the nature of economic interdependencies between different municipalities. We also use a novel methodology to delimit and define functional territories, departing from classical methods relying on commuting flows (see Coombes & Openshaw, 1982, and Duranton, 2015 for the Colombian case), cluster analysis (Tolbert et al., 1987) or threshold approaches (Coombes, Green, & Openshaw, 1986). Instead, our method combines information on the commuting dynamics within a territory with night lights data which captures economic growth and its geographic diffusion.

We build on the literature on likely determinants of regional development. To mention a few, these range from human capital (Modrego & Berdegué, 2015),

to policies facilitating entrepreneurship and private economic activity (Fan et al., 2000; Gao, 2004; Naudé et al., 2008), to politics (Hodler & Raschky, 2014), and to geography (Watkins, 1963). We propose a broad conceptual framework that helps organize these determinants into distinct categories according to their main role in a multi-level scheme of influence.

Finally, we focus on the potentially distinct trajectories of economic growth and social progress or inclusion. The literature on the interdependencies between inequality, poverty and growth is vast (Haughton & Khandker, 2009). The multiple interdependencies imply enormous challenges when trying to empirically establish a clear causal connection between economic growth and poverty or inequality (Srinivasan & Bhagwati, 2001). However, even at a descriptive level, studies have produced few definitive answers and stylized facts on the relationship between economic growth and poverty or inequality.[2] These suggests that this relationship may be highly context-dependent. The first step is therefore to examine the trajectories in specific cases in greater depth. Our study contributes in this direction for the case of Colombia.

The paper proceeds as follows. Section 2 lays out a conceptual framework that guides the way we approach our examination of the possible determinants of economic dynamism and social inclusion in the territories. This section helps motivate the set of variables we include in our analysis. Section 3 describes how we identify these territories, and describes them among relevant directions. In particular, it focuses on how are the territories divided into different categories by degree of urbanization, ranging from the deeply urban to the metropolitan, with rural-urban territories in between. It also looks at the "inputs" for economic dynamism and social inclusion, and how they appear to be distributed by type of territory. Next, Section 4 looks at the trajectories of dynamism and inclusion in these territories. We start by describing how we measure these two key dimensions of performance. Next, we evaluate the "winners" and "losers" on both of these dimensions. Finally, we analyze the empirical correlation between these trajectories of performance and the proposed inputs for dynamism and inclusion. The final section takes stock of our findings and discusses some implications.

[2] Srinivasan (2001) suggests that while there is a positive correlation between faster growth and poverty reduction (see also Chien & Ravallion, 2001), the connection with economic inequality is less clear. Others underscore that growth is not sufficient to reduce poverty (Dollar & Kraay, 2002), or that inequality limits the poverty-reduction benefits of economic growth (Ravallion, 2014), or that higher inequality reduces growth (Benabou, 1996), or that changes in inequality (in any direction) seem to correlate with lower future growth (Banerjee & Duflo, 2003).

2. Conceptual framework

What explains the diverging patterns of economic performance of territories within a polity? Our view emphasizes the importance of distinguishing between fundamental and *proximate* causes (Acemoglu et al., 2005). Proximate causes are the traditional subject matter of modern growth theories which highlight, most notably, investments in human and physical capital and productivity. However, while these theories are often tremendously helpful to understand the *mechanics* of economic growth, they fail to answer the more fundamental question on why some countries and regions are poor and others are rich. If investments, technology and productivity are proximate drivers of prosperity, the key question then becomes: what explains the differences in these crucial factors? In this quest for fundamental causes, we highlight the importance of economic and political institutions (emphasizing the latter), as key underlying drivers of divergence. We build on Fergusson et al. (2017) who take a long-run perspective to examine the large differences in economic development within regions of Colombia.

Fergusson et al. (2017) show that Colombia has had a remarkably persistent pattern of regional inequality. Despite major changes in the structure of the economy, the patterns of urbanization, the changing importance of certain economic sectors and local economies, and the remarkable progress in education, today's richer areas of the country remain the same as 100 years ago (and it seems that they were also the same since colonial times, according to the little data we have). Fergusson et al. (2017) argue that the reason for this persistence is that the poorer parts of Colombia have had worse economic institutions (such as inefficient, ill-defined and ill-enforced property rights), have suffered from inadequate public policy, and have received far fewer public goods compared with the richer parts of Colombia. Moreover, they show that the location of the Colombian state is particularly absent in these less prosperous parts of the country, and has been very persistently so (see also Acemoglu et al., 2015). This persistence reflects a political equilibrium, which has endured for at least 200 years, both because it has created benefits for some and difficulties for those who did not have enough incentives to induce change (see Robinson, 2016 and Fergusson, 2017).

Against this general backdrop of persistence in regional disparities, there exists a shorter-run variation in economic performance between territories. Our objective is to explore these shorter-run changes while recognizing the role of more persistent and fundamental drivers of performance. Moreover, we are interested in

two key dimensions of performance. First, on aggregate economic prosperity, leaving aside any distributional concerns. Second, on the extent to which territories are able to achieve some minimum standards of material welfare for their inhabitants. While both dimensions are clearly interrelated, economic inclusion depends more directly on the distribution of income, and also on the provision of certain basic needs even under conditions of economic scarcity. We will refer to the first main dimension as "economic dynamism" or "growth" and to the second as "economic inclusion" or "social progress".

2.1 Producing dynamism and economic inclusion

To explain our general conceptual approach, we now introduce some notation that helps guide our analysis. Let economic dynamism of a given territory (Y) be described by the following production function:

$$Y = F\left[F_i\left(A_i, K_i, H_i, L_i\right)\right] \quad (1)$$

where F aggregates dynamism (including possible complementarities) by each of several sectors indexed by i, and F_i is a sector-specific production function. K, H and L denote physical capital, human capital, and labor broadly construed, and A captures a wide notion of efficiency or productivity. Underlying this meta-production function for dynamism is the following hierarchy of economic causality that resembles our view on the importance of separating proximate and fundamental determinants:

Y <- Inputs <- Policies <- Institutions/Political equilibrium.

That is, we think of economic dynamism as a function mainly of productive inputs K, H and L (including productive factors, geographical endowments like natural resources and spatial connections, and the overall efficiency in resource allocation). These inputs in turn are influenced by economic policies, including productive policies like sectoral and regional programs, as well as the state's physical and human capital investments. Also, policies result from the set of existing economic institutions (and operate within them), including property rights institutions, market regulation institutions, the extent of state presence, informal laws that shape behavior and the extent to which formal norms are enforced. Finally, these insti-

tutions are political choices that reflect the underlying set of political institutions and equilibrium (the distribution of political power among actors in society). Of course, this is an analytical simplification with several interdependencies ignored (for instance, economic institutions might influence productivity directly, not only through their effect on policies).

One could similarly build an analogous analytical production function for social inclusion, *W*. However, since these outcomes depend crucially on the policies for social inclusion, we may think of the following relation:

$$W = G\,(Y,\ T) \quad (2)$$

where *T* are policies concerning social inclusion (like *safety nets*, social programs, wealth redistribution and redistributive taxation, among others). Undeniably, these social policies also depend on institutions directly, just as economic policies do:

$$W \text{ <- T <- Institutions/Political equilibrium.}$$

But, as highlighted by the *G* (.) function, social inclusion depends also on economic dynamism, thus implying more complex interdependencies:

$$W \text{ <- Y <- Inputs <- Policies <= Institutions/Political equilibrium.}$$

Moreover, since economic inequality and poverty may have effects on economic growth, one could posit a simultaneous aggregated system between dynamism and inclusion, substituting our equation for the following:

$$Y = F\,[F_i\,(A_i, K_i, H_i, L_i), W] \quad (3)$$

The discussion serves to highlight two main features: first, the many (hierarchical) levels of influence among sets of variables and, second, the multiple causal pathways and interdependencies. Clearly identifying just one of these channels is an outstanding channel in itself, and since we want to present a broad picture, we have no pretense of establishing causality. This framework, however, will inform the way in which we will approach and analyze the data presented below.

2.2 The inputs for dynamism and inclusion

Based on the preceding discussion, we organize the inputs for economic dynamism and economic inclusion into the following sets of variables, each of which can be roughly mapped to the causal chain of relationships identified above. The set is limited by data availability in the Colombian case.

1. Human Capital: average years of schooling for the adult population, average test scores, and enrollment rates at different education levels.
2. Geography (overlapping with some aspects of physical capital and infrastructure like access to roads and ports): soil aptitude, average altitude, distance to major cities ports, and markets, access to primary road network, and a dummy variable for the presence of natural parks.
3. Economic policies: municipal budget averages of key line items, namely the extent of municipal savings, reliance on transfers for income, and share of investment expenditure. These are broader categories for local "policies" than one might ideally want, but detailed data on program execution at the municipal level is not easy to collect. Thus, we take more savings and investment expenditures as proxies of adequate local policies, since municipalities with more resources and more investment relative to current expenditures are expected to be in a better position to provide public goods that are important for productivity and social progress. Instead, a strong reliance on national transfers may signal administrative and fiscal weakness, or could imply abundance of resources (like transfers for mineral royalties) that could either substitute or complement local capacity. Thus, we hold no a priori view on the impact of transfers.
4. Violence: violence measures are particularly important in the Colombian case, and reflect a combination of economic institutions and policies (for example, the defense of property rights is a prime economic institution for economic prosperity and for security policies). We use data on the presence of illegal crops (coca), number of forcefully displaced population per capita, homicides per capita, and violent attacks per capita as key measures of the importance of armed conflict locally.
5. Economic institutions: we use the open government index from the *Procuraduría Nacional*, the office in charge of disciplinary oversight of public functionaries in Colombia. This index combines indicators of internal control, re-

cruitment, administrative management systems and accountability, to measure the performance of strategic anticorruption standards. All the components of the index are listed in Table A-1 in the Appendix. Also, we use the share of lands with informal property rights as a measure that reveals the extent of property rights protection, a prime economic institution.

6. Political institutions/equilibrium. Measuring the underlying characteristics of the political equilibrium at the local level is challenging. Ideally, we would like to have a measure that reflects the extent to which effective political power is concentrated in a few hands as opposed to responding to the needs and wants of broad cross sections of society. Building on the analysis of Fergusson et al. (2017) referred to the of the political equilibrium, we look at the physical presence of the state by looking at judges per capita. We also examine the corrupt and clientelistic nature of electoral politics through two measures. First, the share of votes for "parapoliticians", namely politicians with links to paramilitaries, with data from Fergusson, Vargas, and Vela (2013). These alliances clearly curtail accountability to the general population by favoring groups that can capture politics and coerce voters. Second, the share of preferential votes in lists to the Senate and House of representatives. As famously shown in Putnam et al., (1994), preferential voting is a good indicator of a highly personalistic and clientelistic pattern of political exchange in democracies. Fergusson et al., (2017) show, with direct data on vote buying from the *Encuesta Longitudinal de la Universidad de los Andes* (Fergusson et al., 2019, 2018), that the municipal-level proportion of preferential voting in the Congressional elections correlates with clientelistic vote buying, validating this measure. Moreover, as argued in Fergusson (2017), the prevalence of clientelism weakens the "consensually strong state", that is, one that is capable of providing public goods and project its power in the population and territory, while responding politically to the population and remaining accountable.
7. Long-run features of the political (and some aspects of the economic) equilibrium. Finally, we look at longer-run variables related with the historical presence of the colonial state. As shown in Acemoglu et al. (2015) and Fergusson et al. (2017), the presence of the state has been remarkably stable since colonial times, and correlates with better institutional and economic outcomes today.

These categories fall in line with our conceptual framework. Of course, they do not match it exactly for two main reasons. First, distinctions that are analytically transparent are not necessarily so in practice (for example, the violence variables partly capture economic institutions and partly policies, but are also directly the effect of the political equilibrium). Second, limited data availability forces us to be creative in using the available information to learn as much as we can from the data.

3. Functional territories in Colombia

3. 1. Identifying functional territories

A broad literature in regional economics and economic geography emphasizes the central role of agglomerations or spatial centres of economic activity, in which centripetal forces defeat centrifugal ones. A single connected space or "functional economic area" forms (Fox & Kumar, 1965). These functional "territories" form a complex socio-spatial web of overlapping markets between areas or locational entities which have more interaction or connection with each other than with outside areas (Brown & Holmes, 1971; Jones, 2017). They thus exhibit a high frequency of economic and social interactions between their inhabitants, organizations and firms (Berdegué et al., 2011). The size and shape of these geographic spaces have crucial implications for policy design, influencing patterns of mobility and interactions between people, exchanges of goods and ideas, beyond boundaries set by the standard political administrative units.

We build on Berdegué et al. (2017) to map out these functional territories in Colombia. Their method combines satellite night light data to identify updated boundaries of conurbated or metropolitan areas and other urban settlements, with standard clustering procedures using commuting flows, and uses both of them to delineate functional territories. With the 2005 National Census, they build a commuting flows matrix using information at the municipality level (for 1,122 municipalities). The findings imply that 5.3% of the municipal workforce is composed of workers who commute to other municipalities, and that commuting can be as large as 52.2% of a municipality's workforce. These data are combined with night lights from the Defense Meteorological Satellite Programs Operational Linescan System (DMSP-OLS), in particular the average visible, stable lights and cloud free coverage composite for the year 2012. The stable satellite night light images are

based on one-squared kilometers pixels, with light intensity varying from 0 (unlit) to 63 (saturated by light intensity). The patterns of lit areas encompass a high number of small and medium-sized cities in the whole country.

The clustering methodology proceeds in two main steps. First, with the satellite night light images, the location and boundaries of urban settlements are identified. Next, the municipalities that contain the same lit area are merged into a single functional area, since they are geographically integrated as seen from outer space. In the second step, using a hierarchical clustering procedure based on Tolbert and Sizer (1996), municipalities that have a high level of commuting flows but whose interactions with other spatial units were not fully captured by night light data are aggregated to the territory.[3] In a final step, nonadjacent territories that formed after the clustering procedure are manually separated.

3.2 The features of functional territories, from rural to metropolitan

We define five categories of Functional Territories in Colombia, also following Berdegué et al. (2017):

1. Rural territories, where the largest urban area has under 15,000 inhabitants.
2. Rural-urban territories, whose largest urban area ranges from 15,000 to 400,000 inhabitants. Given the wide variation within this set, these territories are divided into three categories based on the size of their largest urban area:

    - Small rural-urban territories (RU1): Largest urban area has more than 15,000 but less than 60,000 inhabitants.
    - Medium rural-urban territories (RU2): Largest urban area has more than 60,000 but less than 120,000 inhabitants.
    - Large rural-urban territories (RU3): Largest urban area has more than 120,000 but less than 400,000 inhabitants.

3. Urban territories, whose largest urban area has over 400,000 and under 600,000 inhabitants.
4. Metropolitan territories, with the largest urban area exceeding 600,000 inhabitants

[3] This commuting clustering method has been widely used in applied economics research (Autor & Dorn, 2013; Autor, Dorn, & Hanson, 2013; Amior & Manning, 2015).

Table 1 describes the resulting division by types of territories. Out of 1,121 municipalities arranged in 860 functional territories, a large majority (67%) are in small rural territories (with under 15,000 people in their largest urban agglomeration). Notice also that these territories tend to be made of a single municipality: 746 rural municipalities make up a total of 717 total territories, so each territory has 1.04 municipalities on average. These areas accumulate 21% of total population, a non-negligible share. When we look at the rural-urban territories, even within the relatively small (type-1 rural-urban areas with under 60,000 people in the largest urban agglomeration) the average number of municipalities per territory increases (157 municipalities make up 98 territories, for 1.6 municipalities on average). This pattern continues as we look into the larger type-2 and type-3 rural-urban territories, which have 3.2 and 3.7 municipalities per territory, respectively. While integrated, the rural-urban territories do not make up a very large share of the population. The three types accumulate 33% of total population, most of it concentrated in either the smallest (type 1, with 12%) or largest (type 3, with 15%) of these territories. The urban category with 400 to 600 thousand people in the largest urban agglomeration encompasses 19 municipalities in merely three territories, yet is surprisingly unimportant as a share of total population in Colombia, accumulating merely 6%. The rest of the population (40% of Colombians) lives in the five large Metropolitan territories with more than 600 thousand people in the largest urban agglomeration and enclosing 71 municipalities.

Table 1

Functional territories in Colombia. Distribution, population, and municipalities by type

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of territory	Rural		Rural-Urban		Urban	Metropolitan	Total
		Type 1	Type 2	Type 3			
Population (thousands)	0 –15	15–60	60–120	120–400	400–600	>600	
Municipalities (number)	746	157	61	67	19	71	1121
Share	0.67	0.14	0.05	0.06	0.02	0.06	1
Territories (number)	717	98	19	18	3	5	860
Share	0.83	0.12	0.02	0.02	0.00	0.01	1
Population 2005 (thousands)	8,929	5,124	2,579	6,347	2,401	17,507	42,888
Share	0.21	0.12	0.06	0.15	0.06	0.4	1

We also examine how these territories look in terms of the inputs for dynamism and inclusion discussed in Section 2. Since each input category (human capital, geography, and so on) can be measured with several variables, we create summary indices by category. This has the advantage of simplifying the description, but also of aggregating information from several potentially noisy variables into one presumably more precise measure of each category. Finally, this reduces the risk of selectively choosing covariates based on the strength of the resulting correlation with outcomes of interest (Casey, Glennerster, & Miguel, 2012). The index in each category C is computed as:

$$Index_C = \frac{1}{|C|}\sum_{c\in C}(v_c - \bar{v}_c)/(\sigma_c) \quad (4)$$

where $\bar{v}$ is variable v_c's mean, σ_c its standard deviation, and $|C|$ the number of variables in category C. We ensure that all variables v_c are coded such that greater values imply better inputs. The set of variables we use are those described in section 2.2, with further details in Appendix Table A-1, which lists all our variables and sources. We exclude from the indices only the few set of variables for which, a priori, we have no clear stance on whether they should improve or harm performance, but may nonetheless be important factors of influence. These are altitude and the indicator for national parks in the geographic index and transfers in the economic policies index.

Table 2 examines the distribution of these standardized indices by type of territory. We run regressions of each of the indices on categorical variables for territory type and omit the constant, saturating the model, so each coefficient is just the average value of the index for each territory. In the upper panel, we examine the levels of the indices in 2005 (a similar picture emerges if using the 2010 values). The geographic endowments appear to be particularly high for the metropolitan and large rural-urban areas, and comparatively smaller elsewhere, especially in the smaller rural areas. The human capital and violence indices monotonically increase with territory category from rural to metropolitan. In terms of economic policies, however, metropolitan areas are not particularly successful. Instead, it is the urban and large rural-urban agglomerations that fare best. Interestingly, there are on average not very large differences in the level of the political institutions index between these territories, but economic institutions do seem distinctively better in the larger agglomerations. Finally, a very noteworthy result concerns the

long-run determinants index, which is very different in each territorial category, descending monotonically as we move from metropolitan to rural areas. Notice also that territorial dummies have the best predictive power when we look at the long-run determinant index (the R-squared is an order of magnitude larger than in any of the other specifications).

Our indices (excluding geography, economic institutions, and the long-run determinants) vary over time from 2005 to 2010. Thus, it is also interesting to examine in which types of territories they have the most significant variations. This is examined in Panel B of Table 2, which now uses the change in the indices as dependent variables on the dummy variables for each territorial category. One interesting result pointing at a force for convergence is that the level advantages in human capital disappear in changes. In fact, metropolitan areas exhibit on average the largest (relative) fall in the human capital index. The remaining territories do not have significant decreases (but also not increases) in the index. The violence index is very flat between territories, whereas the political institutions index (which had limited variation in the levels) improves mostly for the more urbanized types of territories.

Table 2

Inputs for dynamism and inclusion by type of territory

Panel A: Input levels	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dep. variable: standardized input index by category						
	Geography	Human Capital	Economic Policies	Political Institutions	Economic Institutions	Violence	Long-run political
Rural	-0.0267	-0.0887***	-0.0133	0.0135	-0.0388	-0.0170	-0.0349***
	(0.0274)	(0.0228)	(0.0307)	(0.0217)	(0.0274)	(0.0265)	(0.0118)
RU1 (small)	0.0595	0.255***	-0.0905	-0.0906*	0.0832	-0.00110	0.109**
	(0.0767)	(0.0512)	(0.0815)	(0.0540)	(0.0734)	(0.0541)	(0.0424)
RU2 (medium)	0.117	0.499***	0.280**	0.00796	0.244	0.158	0.181***
	(0.131)	(0.125)	(0.128)	(0.113)	(0.163)	(0.0976)	(0.0569)
RU3 (large)	0.419***	0.947***	0.546***	-0.0274	0.566***	0.323***	0.254**
	(0.122)	(0.0860)	(0.106)	(0.107)	(0.130)	(0.0381)	(0.121)
Urban	0.290	1.077***	0.531***	-0.0781	0.570***	0.417***	0.490**
	(0.238)	(0.121)	(0.0906)	(0.209)	(0.0880)	(0.0333)	(0.196)
Metropolitan	0.529***	1.241***	0.333	-0.0211	0.626***	0.437***	0.638***
	(0.156)	(0.0895)	(0.262)	(0.137)	(0.104)	(0.0429)	(0.188)
Observations	860	831	860	850	860	858	806
R-squared	0.013	0.137	0.016	0.004	0.025	0.010	0.071

Panel B: Input changes				
	Dep. variable: change in standardized input index by category.			
	Capital	Policies	Institutions	Violence
Rural	-0.00543	-0.0269	-0.0202	0.00753
	(0.0217)	(0.0259)	(0.0248)	(0.0283)
RU1 (small)	0.0525	0.144	0.0748**	-0.0365
	(0.0492)	(0.100)	(0.0364)	(0.0803)
RU2 (medium)	-0.00380	0.118*	0.126**	-0.0516
	(0.0683)	(0.0603)	(0.0504)	(0.119)
RU3 (large)	0.0316	0.000960	0.154***	-0.0246
	(0.0320)	(0.0481)	(0.0400)	(0.185)
Urban	0.00413	0.0766	0.220***	-0.203
	(0.0378)	(0.106)	(0.0411)	(0)
Metropolitan	-0.199***	0.482	0.200**	0.129
	(0.0433)	(0.376)	(0.0923)	(0.0793)
Observations	798	833	844	707
R-squared	0.002	0.009	0.006	0.001

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

In short, larger and more urbanized agglomerations exhibit important advantages in our geography, human capital, economic institutions, violence, and long-run determinants indices. Moreover, the set of long-run institutional determinants is the one that best helps differentiate the types of territories. When looking at recent changes, no transformation in the essential inputs for economic dynamism and inclusion seem to favor the rural territories or the smaller rural-urban agglomerations. Human capital seems to have increased less for metropolitan areas, and violence is very stable in all territories. Instead, economic and political institutions have increased most in the more complex metropolitan, urban, and large rural-urban concentrations relative to the smaller rural-urban and strictly rural areas. Having looked at the inputs for economic growth and social progress, we now turn at an analysis of these two dimensions of economic performance in the territories.

4. Economic dynamism and social inclusion

4.1 Measuring economic dynamism and social inclusion

We build economic dynamism and social inclusion indices just as we built indices for "inputs". Thus, for instance, denoting the set of variables measuring economic dynamism in each functional territory, we have the following dynamism index:

$$Index_D = \frac{1}{|D|}\sum_{d\in D}(v_d - \overline{v_d})/(\sigma_d) \quad (5)$$

where $\bar{v}_d$ is v_d's mean, and its standard deviation. Again, we ensure all variables are coded such that greater values imply more economic dynamism. $Index_I$ for social progress is constructed analogously, and both indices are measured in 2005 and in 2010. As all other variables in the analysis, the components of the indices and their sources are described in Appendix Table A-1. We now describe the components and the resulting indices.

4.1.1. Economic Dynamism: Variables

To measure economic dynamism or growth we rely on two variables:

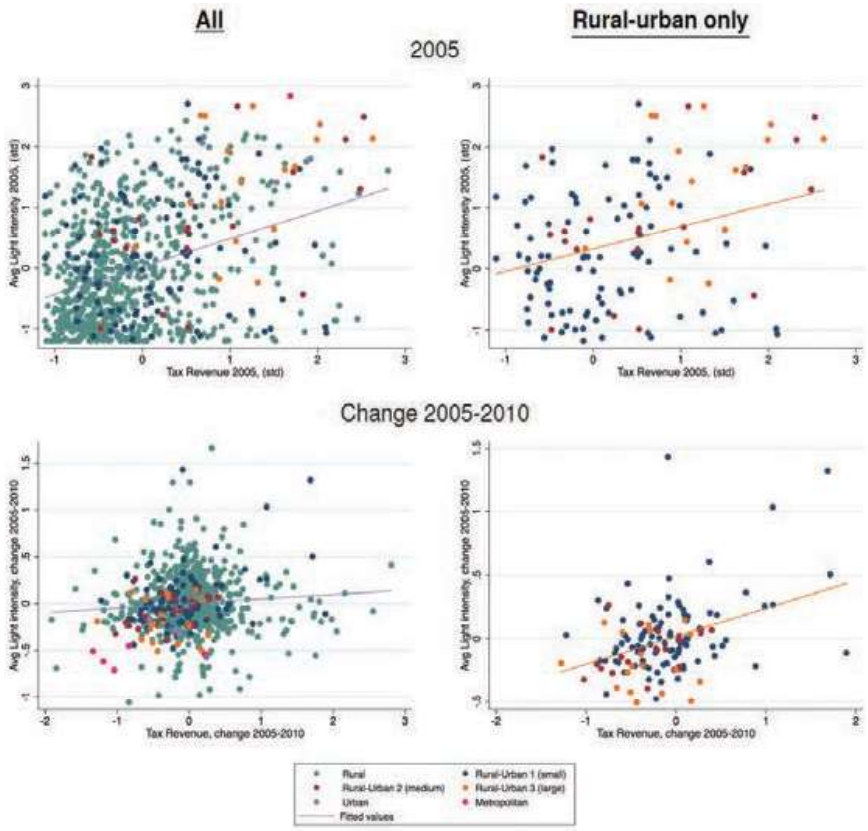
1. Night Light intensity of each functional territory. The stable satellite night light images are based on 1 km^2 sized pixels, each one with a light intensity value that varies in the range from 0 to 63. We construct the average light intensity inside a territory (intensity per km^2). These measures builds on the recent and growing evidence on its relevance to approximate economic activity (for example, Henderson et al., 2012; Donaldson & Storeygard, 2016; Kulkarni et al., 2011).
2. Tax revenue: Adding total tax revenue of all municipalities within a functional territory, we construct the territory's per capita tax revenue.

We would like to have more measures of dynamism, but there is limited data availability on interesting variables with relevant variation at the municipal level (to build aggregates at the level of functional territories). One concern is that tax revenue directly depends on policies, not just on the economic performance of the territories, and policy is a key input in our conceptual framework. Thus, in every analysis we show results for the index as a whole and for the light component alone as a relevant dynamism measure.

In Figure 1 we explore the correlation between the two components of the index. The left column looks at all territories, and the right one at rural-urban areas only. The upper panel shows the levels (in 2005, with a similar picture emerging when we look at 2010), and the lower panel at the change from 2005 to 2010. There is a positive correlation between both measures of economic activity, especially in the levels. The changes are only modestly positively correlated.

FIGURE 1

Correlation between components of the economic dynamism index



4.1.2. Social Inclusion

For measures of social inclusion or progress we rely on two variables:

1. Infant mortality rate: weighted average (by municipal population) of the infant mortality rate of the municipalities within each functional territory.
2. "Sisben" 1: proportion of the population inside a territory ranked in Sisben 1, the lowest tier in a multi-dimensional poverty index based on a census carried out by the Colombian government to target its main conditional cash transfer programs. The survey used to build the index is called the Sisben and the index is also informally referred to with this name.

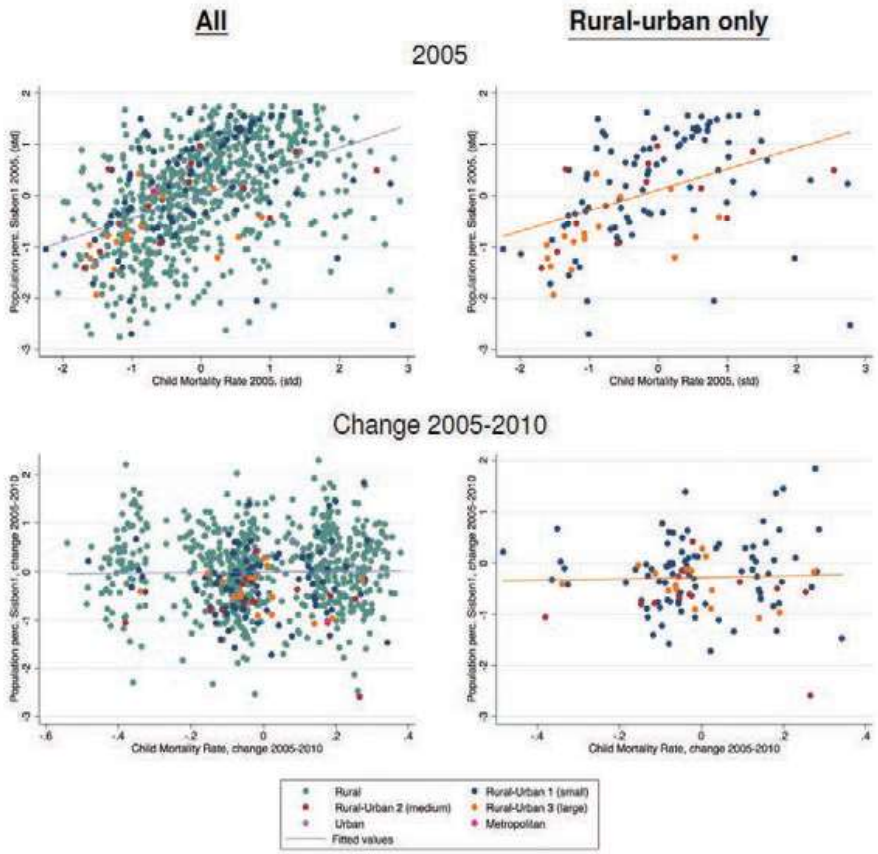
As with economic dynamism, the richness of the data we can use to measure economic inclusion is limited. The Sisben measure very cleanly helps identify the share of the very poor. We rely on measures of infant mortality because it may

respond quickly to good policies even under relatively low levels of income with the provision of basic care and prevention, and also because infant health is a good predictor of the overall future health of the population and other outcomes including later schooling attainments, earnings and employment probabilities (Currie & Hyson, 1999; Currie & Moretti, 2007).[4]

In Figure 2 we explore the correlation between the two components of the index. Again, the left column looks at all territories, and the right one at rural-urban areas only. The upper panel shows the levels (in 2005), and the lower panel at the change from 2005 to 2010. There is a positive correlation between the share of the population in the Sisben 1 category and infant mortality. The changes in the variables, instead, seem largely uncorrelated.

FIGURE 2

Correlation between components of the economic inclusion index



[4] We do not use birth weight, another potential proxy for infant health, out of concerns of measurement error that could be systematically correlated with infants not receiving standard medical attention at birth. We expect less measurement error with deaths.

4.2 Winners and losers: who are they and how do they look like?

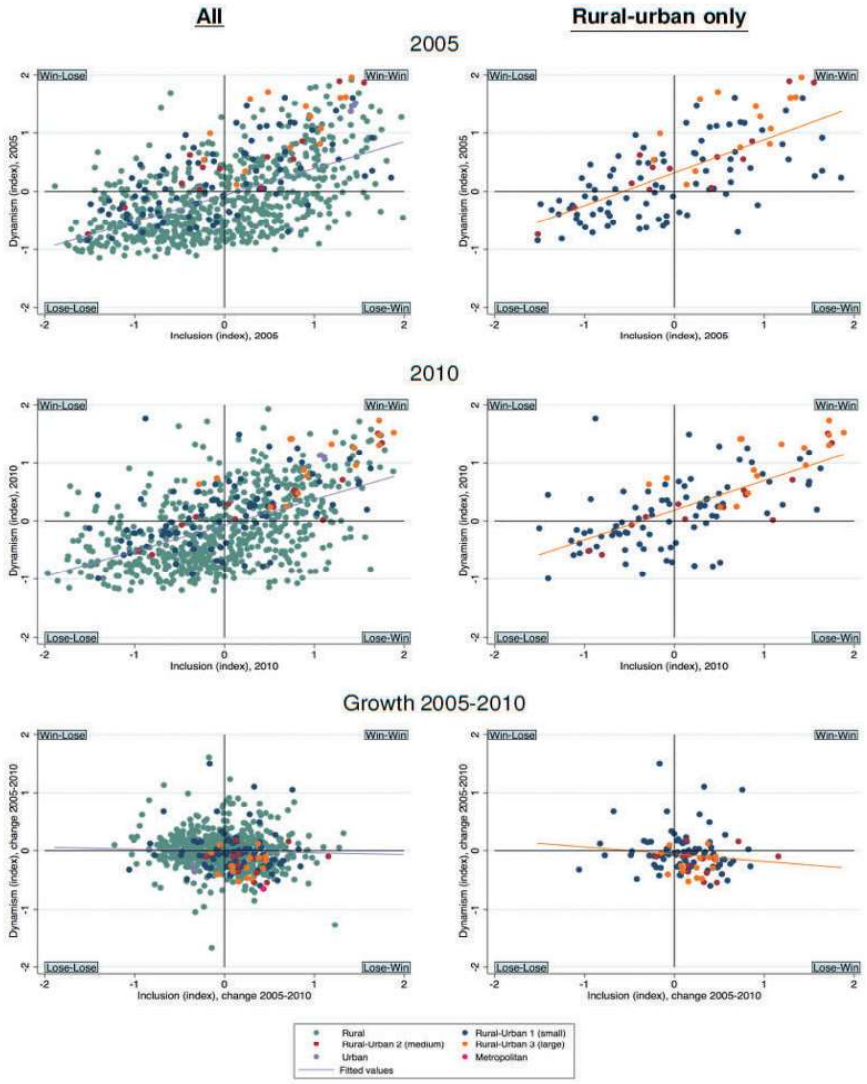
We now explore who are the winners and losers in terms of economic dynamism and inclusion, both statically (that is, which territories have the highest and lowest levels in these performance measures) and dynamically (that is, which have had the largest increases and decreases). To do so, Figure 3 first presents three sets of scatter plots of inclusion versus dynamism, for 2005 (top), 2010 (middle) and the change between these two years (bottom). The left column looks at all territories, and the right only at the rural-urban territories. Each category of territory (rural, rural-urban type 1 to type 3, urban and metropolitan) is depicted with a different color. The pictures thus convey a wealth of relevant information about the features of dynamism and inclusion in Colombian functional territories.[5]

First, in this inclusion versus dynamism space, the more urbanized the territory the more it tends to locate further out (to the right and up). Metropolitan territories are on average more dynamic and inclusive, followed somewhat closer to the origin by urban territories, followed roughly in order by the larger (type 3), medium (type 2), and smaller (type 1) rural-urban territories, and finally followed by rural territories. This stratification is particularly clear in dynamism (that is, vertically in the graph) where the ordering is more precise and the variation within categories smaller, though it is also visible in inclusion (horizontally). Naturally, there are also many more of the smaller (less urban) territories (and most of these are single-municipality ones, recall Table 1). Also, these lower categories of territories exhibit the widest range of variation in performance.

Second, more dynamic places tend to be also the more inclusive ones (whether we look at this in 2005 or in 2010). The slope of the fitted vales is positive in all cases, and it is especially steep when focusing on rural-urban territories, mainly because the wide variation in performance for rural territories attenuates the correlation.

[5] To improve the readability of the figures and avoid correlations being driven by outliers, we drop observations with values larger than 2. In some figures, that implies having no metropolitan areas, which have exceptionally better indicators, especially for economic dynamism.

FIGURE 3
Correlation between economic dynamism (index) and inclusion in functional territories



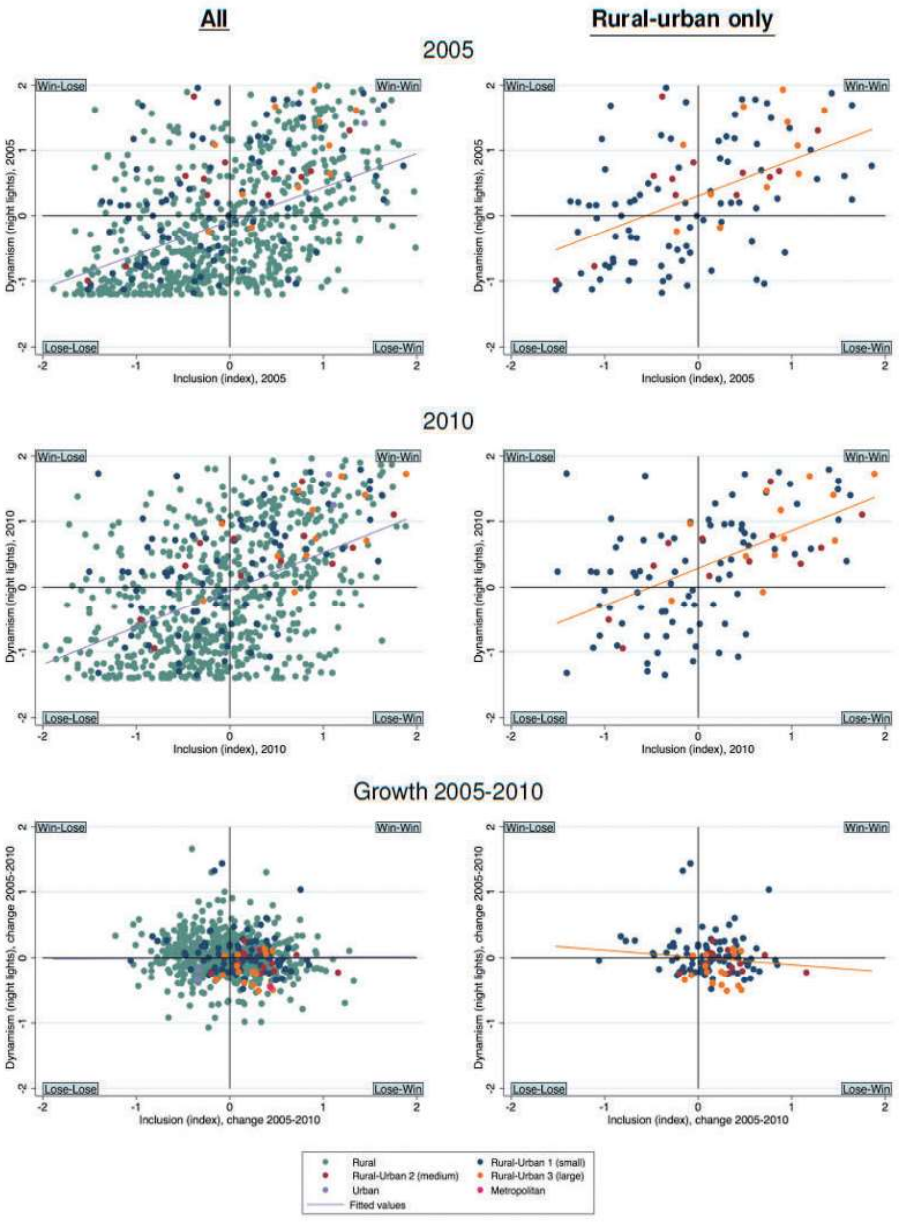
Third, improvements in dynamism do not correlate with improvements in inclusion, regardless of the sample examined. The relationship between changes in dynamism and changes in inclusion is almost perfectly flat. Thus, though over the long run these two dimensions of performance do seem to bear some connection to each other, the short run experience from 2005 to 2010 shows them taking unrelated paths.

In Figure 4 we reexamine these correlations using only night lights as the index for dynamism. The overall messages are similar, with one main exception: the variation in economic dynamism within territories in the same category is now

also substantially higher. The stratification we observed in Figure 3 is therefore less exact, even though it is still roughly present.

FIGURE 4

Correlation between economic dynamism (night lights) and inclusion in functional territories



Another way to look at these "winners" and "losers" by level of urbanization is directly mapping the share of a given type territory in each of the four quadrants for dynamism and inclusion. We do this in Table 3. Each cell shows the share of

territories in the categories described in each column title, relative to the total number of territories of each type, as specified in each row. In columns 1 to 4 we look at static winners and losers (by levels of the indices). Notice that 100% of Metropolitan functional territories are winners in dynamism and winners in inclusion (their performance indices are both larger than zero). Urban territories are also all winners in inclusion and dynamism. Large rural-urban territories also do very well, with 89% in a win-win quadrant, and the remaining in the winner in dynamism, yet loser in inclusion, quadrant. As we go down in the ladder to rural-urban territories and finally to rural territories, we find larger shares of losers in both dimensions. Small rural-urban areas and strictly rural have close to a third of their territories in the lose-lose quadrant. In the lower panel we repeat the exercise excluding tax revenues in the dynamism measure and sticking to lights only. The overall message is roughly the same.

Table 3

Winners and losers in dynamism and inclusion by type of territory

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Winners and losers in dynamism and inclusion							
	Levels				Changes			
Dynamism:	Win	Win	Lose	Lose	Win	Win	Lose	Lose
Inclusion:	Win	Lose	Lose	Win	Win	Lose	Lose	Win
Panel A. Using the dynamism index								
Rural	0.3	0.08	0.36	0.26	0.28	0.26	0.2	0.25
RU1 (small)	0.4	0.18	0.36	0.08	0.23	0.14	0.16	0.46
RU2 (medium)	0.58	0.26	0.11	0.05	0.26	0	0.05	0.68
RU3 (large)	0.89	0.11	0	0	0.06	0.06	0.11	0.78
Urban	1	0	0	0	0	0	0.67	0.33
Metropolitan	1	0	0	0	0	0	0	1
Panel B. Using the dynamism index								
Rural	0.31	0.09	0.35	0.25	0.23	0.26	0.21	0.3
RU1 (small)	0.37	0.21	0.31	0.11	0.29	0.19	0.11	0.41
RU2 (medium)	0.53	0.26	0.11	0.11	0.37	0	0.05	0.58
RU3 (large)	0.83	0.06	0.06	0.06	0.28	0.06	0.11	0.56
Urban	1	0	0	0	0	0	0.67	0.33
Metropolitan	1	0	0	0	0	0	0	1

Notes: Each cell shows the share of territories in the categories described in each column title, relative to the total number of territories of each type, as specified in each row. Thus, for instance, 80% of Metropolitan functional territories are winners in dynamism and winners in inclusion (their performance indices are both larger than zero), and the remaining 20% are winners in dynamism but losers in inclusion and so on.

Instead, when we look at dynamic losers and winners in columns 5 to 8, we find a very different distribution. Indeed, metropolitan, urban, and the larger rural-urban territories move to the dynamism loser quadrant. The good news is that they

do so as inclusion winners. Thus, although they have not had such economic momentum, at least they have achieved gains in inclusion, which may open the road for later sustainable economic achievements. Again, the very small territories are a cause for concern however, since almost one-fifth of the smaller rural-urban territories and of the strictly rural ones are dynamic losers on both dimensions. With these territories having the highest proportion of static losers as well, the result is one of concerning lagging behind for such areas.

FIGURE 5

Convergence in economic dynamism and inclusion in functional territories

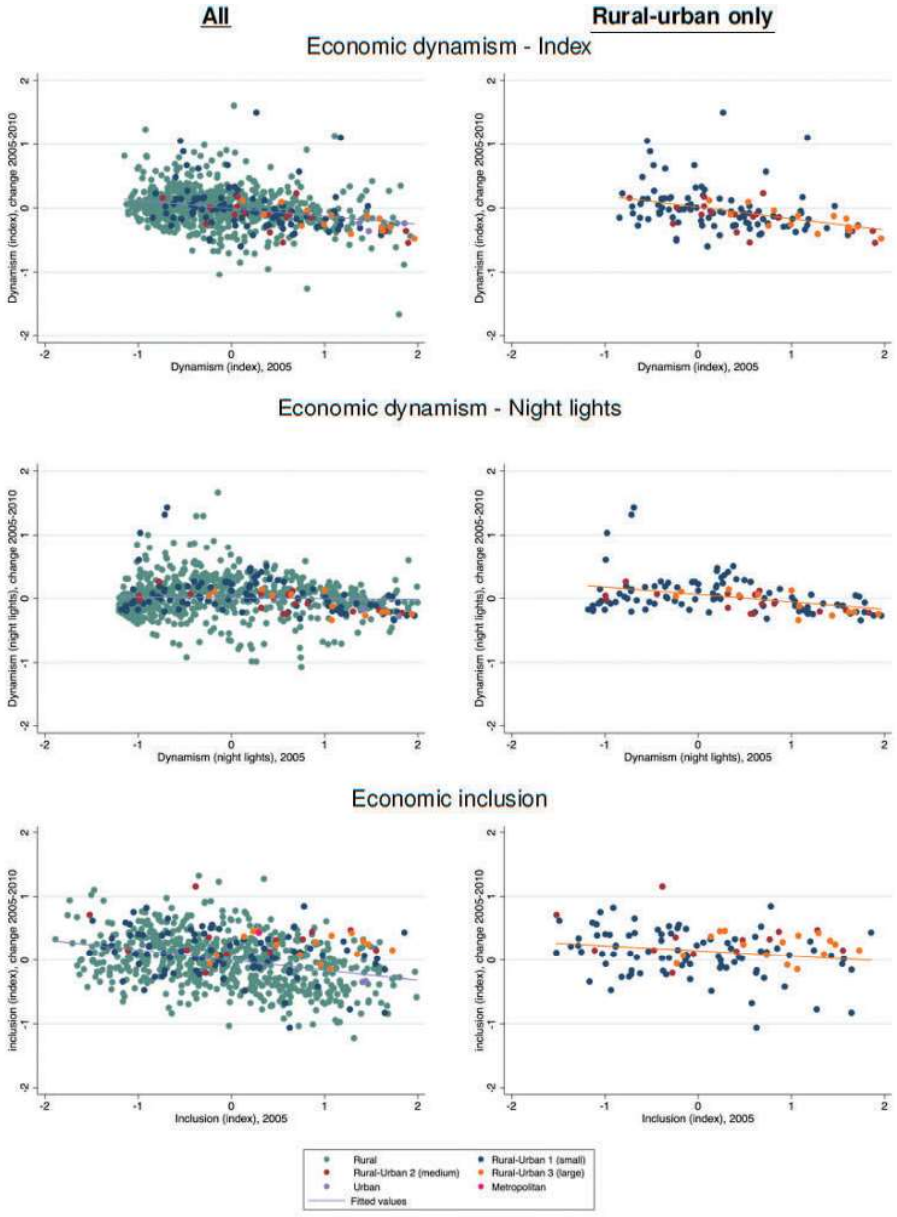
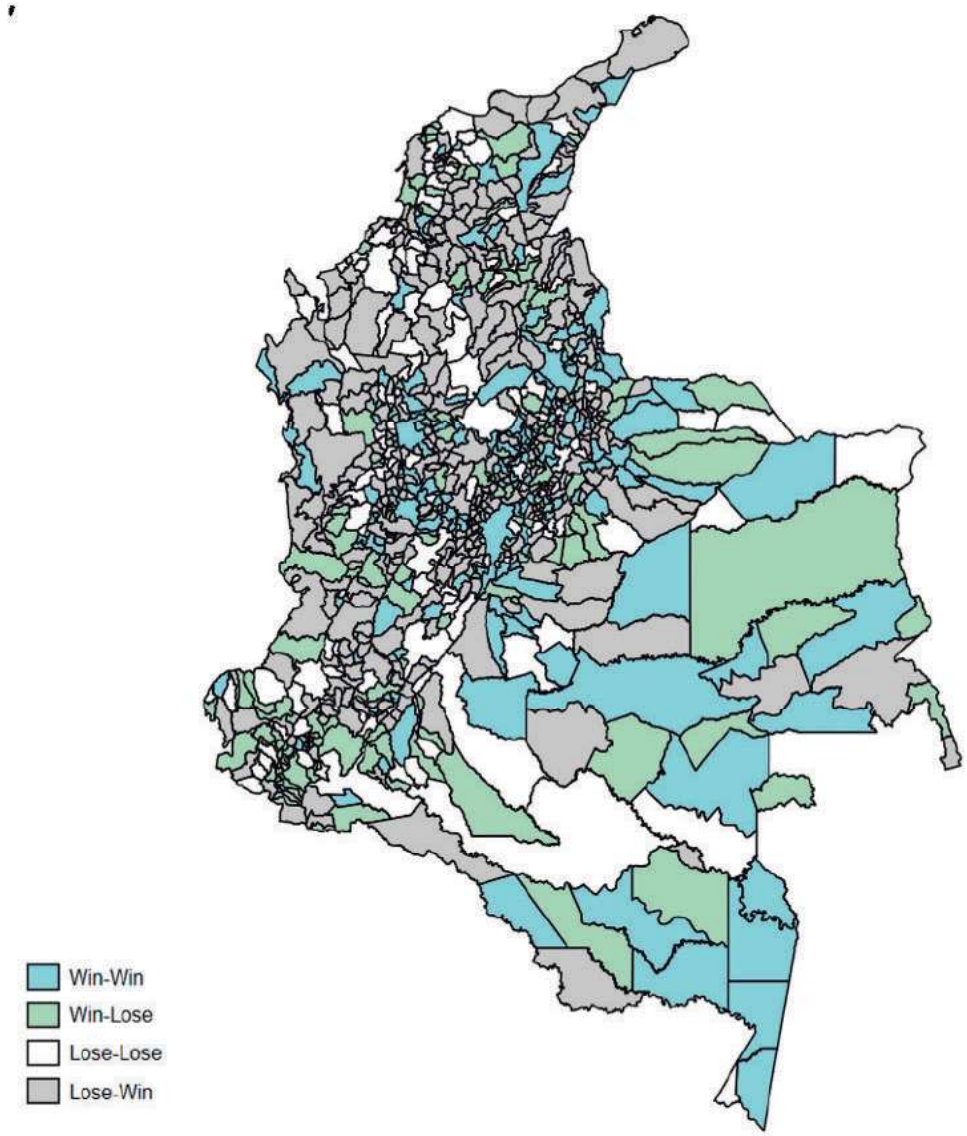


Figure 6 shows a map with the distribution of functional territories in Colombia by type, on the dynamism-inclusion dimensions (win-win, win-lose, lose-win, lose-lose). Two features stand out. First, as we noted, most functional territories are comprised of a single municipality. Second, and perhaps also reflecting the limited connectedness, there are both success and failures spread around the entire Colombian territory.

FIGURE 6

Distribution of functional territories in Colombia by type on the dynamism-inclusion dimensions



We also examine the "inputs" for dynamism and inclusion and how they behave in each of the quadrants of winners and losers. In other words, is it the case that having strong inputs for economic growth and inclusion (as captured by our indices for geographic inputs, human capital inputs, economic policy inputs, etc.) correlates with being a winner in these dimensions? Table 4 looks at this by running regressions of the indices (both their baseline levels in 2005 in columns 1 to 7 and, for those with time variation, their changes from 2005 to 2010 in columns 9 to 11) on dummy variables for each of the winner-loser quadrants. The upper panel A looks at static winners and losers by classifying the quadrants in terms of the baseline dynamism and inclusion levels, whereas panel B looks at dynamic winners and losers by categorizing in terms of the changes in dynamism and inclusion. Some key messages from this table are:

1. The geography index is highest for territories in the static win-win category and lowest in the lose-lose category, but is in fact particularly low for territories in the dynamic win-win categories. That is, while places that are already very inclusive and dynamic tend to have a better geography index, it is in fact those with the least geographic advantages the ones that appear to make a simultaneous progress.
2. The human capital index appears to correlate positively with static winners on the economic dimension (regardless of whether they are winners or losers on inclusion). However, again when looking at changes those with the least human capital advantages are the ones that appear to make a simultaneous progress. This is consistent with the observation that the human capital index decreases most (see column 8, Panel A) for territories in the win-win category to begin with.
3. Economic policies are very erratically correlated with the winner-loser categories (low for static or dynamic win-win territories, high for static winner dynamism-loser inclusion areas, and high for dynamic inclusion losers). Their change, moreover, is not clearly correlated with any of the winner-loser categories.
4. There is no clear pattern between the political institutions index and static or dynamic winners and losers. However, an improvement in this index is observed in static win-win territories and a decrease in static lose-lose territories. Economic institutions are better in win-win territories and worse in lose-lose areas, when examining the static quadrants. However, those territories that were able to make improvements in both dimensions (dynamic win-win areas) did so despite a lower economic institutions index.

5. The violence index, and its improvement (recall, all indices have been recoded so that more means better), is correlated with better chances of being a static winner in both dimensions relative to a static loser in both dimensions. The improvement in violence also seems highest among dynamic winners.
6. The long-run determinants are not strongly correlated with quadrant categories when examined in levels, but they do appear correlated with changes in the inclusion index.

Table 4

Winners and losers in dynamism and inclusion against input indices using dynamism index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Dependent variable: input indices in levels							Dependent variable: input indices changes			
	Geography	Human Capital	Economic Policies	Political Institutions	Economic Institutions	Violence	Long-run political	Human Capital	Economic Policies	Political Institutions	Violence
Panel A. Dynamism level 2005-Inclusion level 2005											
Win-Win	0.166***	0.364***	-0.147**	0.0267	0.260***	0.239***	0.0897***	-0.115***	0.00225	0.168***	0.126***
	(0.0584)	(0.0336)	(0.0607)	(0.0286)	(0.0392)	(0.0216)	(0.0234)	(0.0247)	(0.0242)	(0.0278)	(0.0170)
Win-Lose	-0.0371	0.106*	0.286***	-0.152**	0.102*	0.122**	-0.0680**	0.142***	0.167	-0.0411	-0.202
	(0.0691)	(0.0600)	(0.0662)	(0.0712)	(0.0606)	(0.0537)	(0.0291)	(0.0448)	(0.121)	(0.0332)	(0.155)
Lose-Lose	-0.130***	-0.285***	0.0114	0.0311	-0.311***	-0.231***	-0.0530***	0.0937**	-0.00115	-0.187***	-0.0780*
	(0.0294)	(0.0346)	(0.0444)	(0.0385)	(0.0454)	(0.0479)	(0.0189)	(0.0374)	(0.0559)	(0.0466)	(0.0427)
Lose-Win	-0.0298	-0.114***	0.0792**	-0.0227	0.0472	-0.0473	-0.0252	-0.0279	-0.0687***	0.0667**	0.0420
	(0.0390)	(0.0385)	(0.0367)	(0.0341)	(0.0466)	(0.0511)	(0.0222)	(0.0427)	(0.0212)	(0.0338)	(0.0549)
Observations	860	831	860	850	860	858	806	798	833	844	707
R-squared	0.029	0.194	0.025	0.009	0.107	0.086	0.037	0.033	0.008	0.060	0.024
	Dependent variable: input indices in levels							Dependent variable: input indices changes			
	Geography	Human Capital	Economic Policies	Political Institutions	Economic Institutions	Violence	Long-run political	Human Capital	Economic Policies	Political Institutions	Violence
Panel B. Dynamism change - Inclusion change											
Win-Win	-0.263***	-0.170***	-0.347***	0.126***	-0.226***	0.0605*	-0.0216	0.0620	0.0514	-0.0606	0.144***
	(0.0603)	(0.0433)	(0.0760)	(0.0451)	(0.0500)	(0.0345)	(0.0223)	(0.0377)	(0.0748)	(0.0429)	(0.0230)
Win-Lose	0.120***	0.0173	-0.0365	-0.0991**	0.145***	-0.0753	-0.0468**	-0.0239	0.0144	0.136***	0.0693**
	(0.0360)	(0.0354)	(0.0447)	(0.0396)	(0.0413)	(0.0500)	(0.0232)	(0.0364)	(0.0468)	(0.0423)	(0.0323)
Lose-Lose	0.0950*	0.0406	0.201***	-0.0822**	0.0966*	-0.0243	-0.0140	-0.0832**	-0.0578*	0.0392	-0.134
	(0.0514)	(0.0448)	(0.0452)	(0.0347)	(0.0552)	(0.0594)	(0.0244)	(0.0393)	(0.0346)	(0.0401)	(0.0925)
Lose-Win	0.0785*	0.0993**	0.209***	0.0233	0.0254	0.0216	0.0648***	0.0272	-0.0151	-0.0823**	-0.0860*
	(0.0416)	(0.0438)	(0.0333)	(0.0320)	(0.0486)	(0.0437)	(0.0237)	(0.0366)	(0.0298)	(0.0400)	(0.0501)
Observations	860	831	860	850	860	858	806	798	833	844	707
R-squared	0.048	0.028	0.082	0.025	0.039	0.006	0.017	0.009	0.003	0.021	0.026

Notes: Estimation sample includes all types of territories: Rural, Rural-urban, Urban and Metropolitan. Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

As an additional exercise, we analyze the convergence for the change of dynamism and inclusion from 2005 to 2010, conditional on the initial level of each indicator. Figure 5 examines simple graphs of this "conditional convergence". The upper panel looks at the dynamism index, and suggests that initially more dynamic territories tend to have slower growth in dynamism, especially among rural-urban territories. This evidence for convergence is much weaker when focusing merely on the night lights measure. Finally, the lower panel looks at inclusion, finding again a (small) negative slope suggesting some conditional convergence.

In summary, it is hard to disentangle a simple story where winners (be it those starting well of or those making the most significant progress) are obviously better endowed with the inputs for economic growth and inclusion, or have made the most significant improvements in these indices. This contrasts with the correlation we observed between these inputs and the types of territories. In fact, when focusing at the baseline levels of inclusion and dynamism, while it seems that as we go down the ladder of urban complexity (from metropolitan to rural) the inputs for economic inclusion and dynamism tend to get worse (recall Table 2), and while on average the more complex territories are more likely to be winners than losers in these performance dimensions (Table 3), that does not automatically imply that the more successful territories have consistently better inputs (Table 4). When we look at changes in economic dynamism and inclusion, the picture is even less clear. Of course, this is a very rough description and the limitations of our data might obscure underlying relations. However, some clearer conclusions emerge when we look at the regression evidence below.

4.3 Unpacking the determinants of dynamism and inclusion

Finally, we turn to a regression analysis. In this section, we move beyond the description so far by looking at each individual component of the main categories of inputs as righthand side variables in equations for economic dynamism and inclusion. We reiterate that the framework in section 2 implies we have overlapping levels of influence and that we have no pretense of establishing causal relationships in this paper, only exploring correlations that help suggest which factors are likely to play an influence. Thus, we also do not attempt to disentangle the causal pathways, which is challenging even in the presence of exogenous experimental variation in the levers of interest (Green et al., 2010; Gelman, 2011).

Also, even at a descriptive level, these overlapping levels of influence would complicate the interpretation of multivariate regressions (Angrist & Pischke, 2008). We thus focus on regressions of the outcomes of interest (Y and W in our notation), on each set of "categories" of inputs/determinants separately. Also, we look at the following set of complementary specifications:

- Regressions for changes of Y (and W) on determinants X. These regressions help us study the shorter-run variation in our two key outcomes, as a function of the relative abundance/scarcity of key inputs.

- Regressions for changes of *Y* (and *W*) on changes in determinants *X*. This variation on the short-run analysis is motivated both by economic and econometric reasons:
    - The economic motivation is that while one view is that the stock of some of these inputs matters for performance (for instance, the stock of human capital may be key for economic dynamism), another idea is that further investments in these inputs are necessary for results (in the example, it is the growth in human capital which may increase economic growth).
    - The econometric motivation is that, when thinking of a primitive relation between Y and X in levels, a regression of changes on changes controls for all constant unobservable characteristics that could otherwise influence our coefficients. Thus, we would be particularly confident about the robustness of correlations of changes on changes.
- Regressions for levels of *Y* (and *W*) on determinants *X*. These final sets of regressions are motivated by the idea that these are long-run processes and the correlations between these variables often reflect an underlying deeper (political) equilibrium. We also show for completeness regressions for levels of *Y* (and *W*) on changes in determinants *X*, but we have no clear conceptual justification for such specification.

Finally, in regressions for changes of *Y* (and *W*) on determinants we show results both including and without including the "conditional convergence" term of initial *Y* (correspondingly, *W*).

Results are in Tables 5 to 11. All regressions have the same structure. In columns 1 to 6 we look at the growth in economic dynamism (columns 1 and 2 with the index and columns 3 and 4 with the night lights component only) and economic inclusion (columns 5 and 6). In these first set of columns, odd columns do not include the initial value of the dependent variables, and even columns do. Columns 7 to 9 use the level of dynamism as the dependent variable: the dynamism index in column 7, only the night lights component in column 8, and the inclusion index in column 9.[6] Finally, the upper panel A looks at the right-hand side variables in levels ("levels model"), and the lower panel B uses the growth of the variables ("acceleration model").

[6] When looking at the levels, we take the average for 2005 and 2010 to reduce potential noise in a year's measure. However, results are similar taking either year as the proxy for the longer-run behavior of key outcomes of interest.

Table 5

Economic dynamism and inclusion in Colombia, 2005-2010 Human capital

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable	Growth in economic...						Average level of economic...		
	Dynamism				Inclusion		Dynamism		Inclusion
	Index		Night lights		Index		Index	Night lights	Index
Panel A. "Levels model" (Initial Human Capital Stock)									
Dynamism index 2005		-0.178***							
		(0.0295)							
Night lights 2005				-0.0817***					
Inclusion 2005						-0.249***			
						(0.0188)			
Years of schooling 2005	-0.0930***	-0.00709	-0.0584***	-0.0347**	0.0514**	0.130***	0.437***	0.398***	0.343***
	(0.0169)	(0.0189)	(0.0138)	(0.0138)	(0.0232)	(0.0233)	(0.0399)	(0.0460)	(0.0366)
Saber test scores 2005	0.00544	0.00625	-0.00668*	-0.00691**	-0.0229***	-0.00676	0.00726	-0.00748	0.0534***
	(0.00485)	(0.00460)	(0.00344)	(0.00339)	(0.00569)	(0.00530)	(0.00640)	(0.00945)	(0.00961)
Primary enrollment rate 2005	0.0162	0.0169	0.00125	-0.0310	-0.200**	-0.426***	0.0119	-0.583***	-1.009***
	(0.0753)	(0.0734)	(0.0597)	(0.0600)	(0.0904)	(0.0823)	(0.127)	(0.157)	(0.155)
Secondary enrollment rate 2005	0.256**	0.325***	0.273***	0.336***	-0.0958	-0.0423	0.513***	1.268***	0.167
	(0.106)	(0.109)	(0.0662)	(0.0718)	(0.0976)	(0.0937)	(0.143)	(0.193)	(0.165)
Constant	0.220	-0.453*	0.557***	0.466***	0.986***	-0.123	-3.673***	-2.561***	-3.965***
	(0.260)	(0.269)	(0.170)	(0.167)	(0.281)	(0.273)	(0.384)	(0.492)	(0.504)
Observations	827	827	827	827	734	734	827	827	734
R-squared	0.031	0.103	0.035	0.057	0.040	0.226	0.440	0.360	0.371
Panel B. "Acceleration model" (Growth in Human Capital Stock)									
Dynamism index 2005		-0.127***							
		(0.0153)							
Night lights 2005				-0.0780***					
				(0.0140)					
Inclusion 2005						-0.164***			
						(0.0173)			
Saber test scores 2005	0.134	0.0652	-0.217	-0.288	0.0296	-0.175	-0.475	-1.447**	-1.236**
	(0.327)	(0.321)	(0.192)	(0.197)	(0.308)	(0.288)	(0.403)	(0.562)	(0.498)
Primary enrollment rate 2005	-0.0328	0.00639	0.0898	0.100	0.229**	0.209**	0.292*	0.245	-0.00687
	(0.0865)	(0.0877)	(0.0609)	(0.0612)	(0.0973)	(0.0918)	(0.174)	(0.211)	(0.204)
Secondary enrollment rate 2005	0.0971**	0.0514	-0.0136	-0.0376	0.0673*	-0.00330	-0.310***	-0.461***	-0.398***
	(0.0408)	(0.0419)	(0.0304)	(0.0302)	(0.0384)	(0.0394)	(0.0624)	(0.0788)	(0.0890)
Constant	-0.0138	0.00184	0.0235*	0.0949***	0.00590	0.0247	0.116***	0.162***	0.118***
	(0.0175)	(0.0165)	(0.0134)	(0.0198)	(0.0207)	(0.0199)	(0.0405)	(0.0496)	(0.0431)
Observations	796	796	796	796	707	707	796	796	707
R-squared	0.010	0.076	0.004	0.035	0.017	0.127	0.026	0.040	0.046

Notes: Estimation sample includes all types of territories: Rural, Rural-urban, Urban and Metropolitan. Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

Results in Table 5 for human capital inputs reveal that, aside from the secondary school enrollment rate, no other human capital variable seems to correlate positively and robustly with improvements in economic dynamism. The effects of some inputs such as Saber 2005 score and the primary enrollment rate, are not robust to the different measures of economic dynamism. Coefficients' signs vary on whether dynamism is measured as the composite index or as night lights. In addition, no human capital variable correlates with improvements in inclusion. When looking at increases in the human capital inputs, the lack of a clear correlation is even more prevalent, for both dynamism and inclusion. Looking at the longer-run result of existing levels of dynamism and inclusion the years of education are indeed higher in places with more dynamism and inclusion. While this is as expected, that human capital improvements do not correlate with better growth or inclusion casts doubts on the extent to which human capital has even been a successful proximate determinant of these dimensions of performance in the Colombian territories. Like many other developing countries (Glewwe et al., 2011), Colombia has invested substantially in the expansion of public education and increased coverage, yet continues to lag behind in quality (Holm-Nielsen et al., 2003; Faguet & Sanchez, 2008; Barrera-Osorio et al., 2012). Inappropriate quality could thus explain this result. However, we should not overemphasize this since another conjecture is that education expenditures simply take a longer time to translate into productivity gains.

In Table 6 we move to the geographic inputs. In this case, we can only examine the levels because we have no time variation. Notably, these inputs exhibit a comparatively more robust correlation with economic growth. It is clear that distance to main economic centers like major cities and markets, correlates negatively with improvements in growth. However, the coefficients' signs of the distance to the nearest port are not robust to alternative measures of economic dynamism. For inclusion, distance to markets and to the nearest big city are (counterintuitively) correlated with weaker improvements. When examining the levels for outcomes, this surprising correlation disappears and we find in addition a positive correlation of growth with soil aptitude: the territories with best results in dynamism and inclusion measures are those with best soils. Overall, the geographic endowments (broadly construed to include roads infrastructure and connectivity) appear to be important correlates of economic growth (in the short and long run) and social progress in the long run. Of course, a key caveat that applies in all our analysis but particularly in this case is that connectivity reacts to socioeconomic outcomes, so this strong correlation likely reflects, at least in part, reverse causality. In any case,

for further study, these findings encourage a more detailed examination of the causal role of these factors. Pointing to their importance, Duranton (2015) shows that poor access road infrastructure is indeed a major impediment to trade for Colombian cities.

Table 6
Economic dynamism and inclusion in Colombia, 2005-2010. Geography

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Growth in economic...						Average level of economic...		
	Dynamism				Inclusion		Dynamism		Inclusion
	Index		Night lights		Index		Index	Night lights	Index
Dynamism index 2005⊠		-0.202***							
		(0.0366)							
Night lights 2005				-0.114***					
				(0.0165)					
Inclusion 2005						-0.130***			
						(0.0205)			
Land aptitude index	-0.00752	0.0133	-0.00905	0.000822	-0.00913	-0.00403	0.0994***	0.123***	0.0347
	(0.00868)	(0.00956)	(0.00804)	(0.00814)	(0.0127)	(0.0122)	(0.0220)	(0.0285)	(0.0226)
Altitude	-2.51e-05*	-2.45e-05**	-1.17e-05*	-4.38E-06	-1.73E-05	1.70E-06	-9.56E-06	8.86E-05	0.000138**
	(1.32e-05)	(1.20e-05)	(6.31e-06)	(6.03e-06)	(1.96e-05)	(1.22e-05)	(1.54e-05)	(6.22e-05)	(6.14e-05)
Distance to nearest city	0.0452*	0.0425*	-0.0169	-0.00892	0.141***	0.127***	0.00902	0.0943	-0.0397
	(0.0251)	(0.0218)	(0.0171)	(0.0170)	(0.0238)	(0.0226)	(0.0494)	(0.0598)	(0.0507)
Distance to nearest market	-0.000813***	-0.000925***	-0.000532***	-0.000644***	0.00152***	0.00110***	-0.000960*	-0.00171***	-0.00252***
	(0.000306)	(0.000246)	(0.000154)	(0.000161)	(0.000264)	(0.000258)	(0.000526)	(0.000604)	(0.000595)
Dist. Bogota	-0.000162	-0.000345**	8.64E-07	-9.31E-05	-0.00118***	-0.00115***	-0.000986**	-0.00121**	-0.000383
	(0.000185)	(0.000152)	(0.000138)	(0.000138)	(0.000173)	(0.000171)	(0.000399)	(0.000480)	(0.000360)
Distance to nearest fluvial port	0.0320**	0.0255*	-0.0124	-0.0282***	-0.0908***	-0.0786***	-0.0162	-0.210***	0.0486
	(0.0163)	(0.0155)	(0.0103)	(0.0107)	(0.0147)	(0.0139)	(0.0272)	(0.0357)	(0.0318)
Access to primary roads	0.0344	0.100***	0.00380	0.0313	0.0157	0.0361	0.342***	0.356***	0.165***
	(0.0291)	(0.0315)	(0.0208)	(0.0214)	(0.0287)	(0.0280)	(0.0468)	(0.0616)	(0.0515)
Park area	0.198	-0.0289	0.220	0.0335	1.122**	1.076**	-1.024	-2.293***	0.209
	(0.479)	(0.516)	(0.149)	(0.153)	(0.524)	(0.531)	(0.745)	(0.734)	(0.557)
Constant	0.00987	0.0185	0.168***	0.288***	0.206***	0.199***	0.0477	0.432**	0.0482
	(0.0678)	(0.0570)	(0.0481)	(0.0529)	(0.0725)	(0.0653)	(0.133)	(0.183)	(0.165)
Observations	837	837	837	837	741	741	837	837	741
R-squared	0.035	0.170	0.049	0.102	0.132	0.187	0.163	0.222	0.243

Notes: Estimation sample includes all types of territories: Rural, Rural-urban, Urban and Metropolitan. Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

Economic policies are examined in Table 7. As we noted above, unfortunately we have to rely on very broad measures of economic policies with the municipal Budget categories. Perhaps for this reason, the picture that emerges is not all that clear. More savings correlate with less growth but (less robustly) with more increases in inclusion, and the level of economic activity and inclusion is higher in places with more savings. Relying on transfers correlates with less progress of both indicators once we control for conditional convergence, and is also correlated with lower levels of both indices. This last result suggests that transfers substitute, rather than complement, local capacities. It is also consistent with findings suggesting a local resource curse in Colombia from over reliance in external transfers in resource-rich municipalities (see, for instance, Martínez, 2016). Notice however that when we look at the changes in savings, transfers, and investment, there is no clear robust correlation with performance.

Levels of violence, except the homicide rate which is positive in regressions for changes in dynamism (possibly reflecting the idea that crime is a key problem of larger and bigger cities) and initial coca which is positive in levels for inclusion, are typically predictors of poor performance both in terms of the increases and the levels of the indices (Table 8). When we use the changes in inputs, some of these correlations (notably, with coca cultivation) disappear, but the correlations that we do find with performance, including the changes in the homicide rate, suggest that violence hurts performance.

Table 7

Economic dynamism and inclusion in Colombia, 2005-2010. Economic policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Growth in economic...						Average level of economic...		
	Dynamism				Inclusion		Dynamism		Inclusion
	Index		Night lights		Index		Index	Night lights	Index
Panel A. "Levels model" (Initial policies)									
Dynamism index 2005		-0.213***							
		(0.0404)							
Night lights 2005				-0.0704***					
				(0.0141)					
Inclusion 2005						-0.174***			
						(0.0168)			
Saving rate 2005	-0.00472***	-0.00263***	-0.00213***	-0.00177***	0.000418	0.00156**	0.00741***	0.00640***	0.00681***
	(0.000840)	(0.000787)	(0.000621)	(0.000613)	(0.000760)	(0.000753)	(0.00124)	(0.00160)	(0.00140)
Transfers income	-0.00275	-0.00682***	-0.000774	-0.00128*	0.000977	-0.000792	-0.0205***	-0.0109***	-0.00970***
	(0.00177)	(0.00209)	(0.000667)	(0.000674)	(0.000927)	(0.000874)	(0.00172)	(0.00211)	(0.00188)
Investment rate 2005	0.00599*	0.00310	-7.00E-05	-0.00101	0.00121	-0.000806	-0.0105	-0.0197***	-0.0110*
	(0.00330)	(0.00272)	(0.00138)	(0.00137)	(0.00179)	(0.00137)	(0.00692)	(0.00637)	(0.00587)
Constant	-0.157	0.324*	0.122	0.284***	-0.183	0.0815	2.175***	2.253***	1.430***
	(0.225)	(0.186)	(0.103)	(0.109)	(0.136)	(0.0977)	(0.585)	(0.523)	(0.488)
Observations	838	838	838	838	742	742	838	838	742
R-squared	0.052	0.172	0.022	0.045	0.004	0.126	0.326	0.107	0.112
Panel B. "Acceleration model" (Improvement in Policies)									
Dynamism index 2005		-0.175***							
		(0.0313)							
Night lights 2005				-0.0672***					
				(0.0133)					
Inclusion 2005						-0.161***			
						(0.0163)			
Saving rate 2005-2010	0.000283	6.99E-05	-0.000170***	-0.000218***	0.000312***	0.000280***	-0.00107***	-0.00112***	-4.69E-05
	(0.000183)	(0.000181)	(5.63e-05)	(6.23e-05)	(6.69e-05)	(5.73e-05)	(0.000127)	(0.000232)	(0.000320)
Transfers income 2005-2010	0.0627	0.0825*	-0.00446	-0.00884	0.0158	-5.46E-05	0.144***	-0.0983*	-0.0904
	(0.0502)	(0.0489)	(0.0120)	(0.0111)	(0.0186)	(0.0134)	(0.0451)	(0.0550)	(0.0585)
Investment rate 2005-2010	0.239	0.356	0.120*	0.146**	0.0319	0.00538	0.788***	0.636**	-0.149
	(0.310)	(0.283)	(0.0615)	(0.0583)	(0.100)	(0.109)	(0.171)	(0.279)	(0.235)
Constant	-0.0168	-0.0221	-0.00440	0.0497***	-0.00452	-0.00160	-0.0387	-0.0150	0.0159
	(0.0161)	(0.0153)	(0.0108)	(0.0158)	(0.0151)	(0.0145)	(0.0272)	(0.0360)	(0.0316)
Observations	833	833	833	833	736	736	833	833	736
R-squared	0.014	0.130	0.003	0.026	0.001	0.117	0.031	0.010	0.006

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

Table 8

Economic dynamism and inclusion in Colombia, 2005-2010. Violence

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Growth in economic...						Average level of economic...		
	Dynamism				Inclusion		Dynamism		Inclusion
	Index		Night lights		Index		Index	Night lights	Index
Panel A. "Levels model" (Initial violence)									
Dynamism index 2005		-0.183***							
		(0.0325)							
Night lights 2005				-0.0723***					
				(0.0143)					
Inclusion 2005						-0.157***			
						(0.0166)			
Coca cultivation 2005	-27.27***	-38.70***	-10.16**	-15.66***	34.02***	17.81**	-76.28***	-117.4***	-86.31***
	(5.931)	(6.520)	(4.069)	(4.291)	(7.909)	(7.841)	(11.58)	(16.71)	(20.57)
Internally displaced persons 2005	-0.726	-2.216**	0.00259	-0.433	1.801*	-0.703	-8.525***	-8.896***	-15.06***
	(1.090)	(1.005)	(0.458)	(0.461)	(0.970)	(0.832)	(1.483)	(2.166)	(1.973)
Homicide rate 2005	31.14***	30.64***	23.04***	20.22***	-65.39***	-43.50***	12.84	-45.89*	106.8***
	(11.35)	(10.19)	(6.527)	(6.747)	(12.52)	(11.26)	(19.94)	(23.98)	(22.64)
Terrorist attacks 2005	9.073	-13.72	-64.92***	-68.85***	53.83	50.01	-120.4	-112.6	2.599
	(35.37)	(31.88)	(16.08)	(22.62)	(40.60)	(44.59)	(89.91)	(171.7)	(74.53)
Constant	-0.0271	-0.00165	-0.0227	0.0482**	0.0598***	0.0627***	0.126***	0.235***	0.0484
	(0.0188)	(0.0152)	(0.0146)	(0.0220)	(0.0189)	(0.0184)	(0.0379)	(0.0497)	(0.0422)
Observations	838	838	838	838	742	742	838	838	742
R-squared	0.019	0.136	0.017	0.041	0.060	0.157	0.090	0.116	0.120
Panel B. "Acceleration model" (Change in violence)									
Dynamism index 2005		-0.136***							
		(0.0154)							
Night lights 2005				-0.0763***					
				(0.0142)					
Inclusion 2005						-0.167***			
						(0.0184)			
Coca cultivation 2005-2010	-0.00266	-0.00292	-0.00113	-0.00163	-0.00149	-0.00160	-0.00318	-0.0101***	-0.00140
	(0.00272)	(0.00259)	(0.00103)	(0.00113)	(0.00269)	(0.00174)	(0.00353)	(0.00368)	(0.00611)
Internally displaced persons 2005-2010	-0.0761***	-0.0841***	-0.0292	-0.0322	0.0532**	0.0612***	-0.0966**	-0.0727	0.0747
	(0.0223)	(0.0215)	(0.0229)	(0.0226)	(0.0241)	(0.0230)	(0.0392)	(0.0501)	(0.0640)
Homicide rate 2005-2010	-0.0326	-0.0854**	-0.116***	-0.134***	0.0588	-0.0780	-0.405***	-0.408**	-0.791***
	(0.0442)	(0.0428)	(0.0396)	(0.0402)	(0.0592)	(0.0628)	(0.114)	(0.164)	(0.136)
Terrorist attacks 2005-2010	-0.0155	-0.0122	-0.00412	-0.00611	-0.0240*	-0.0352***	0.0163	-0.0406*	-0.0794***
	(0.0120)	(0.0119)	(0.00898)	(0.00909)	(0.0125)	(0.0117)	(0.0211)	(0.0238)	(0.0247)
Constant	0.0341*	0.0285*	0.00617	0.0664***	-0.00445	-0.0194	-0.0238	-0.0342	-0.0918**
	(0.0175)	(0.0173)	(0.0113)	(0.0168)	(0.0190)	(0.0181)	(0.0324)	(0.0428)	(0.0379)
Observations	705	705	705	705	628	628	705	705	628
R-squared	0.031	0.106	0.020	0.051	0.008	0.125	0.027	0.027	0.060

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

We move to the deeper determinants in Tables 9 to 11. Table 9 shows that the open government index is very significantly and positively correlated with good outcomes in the long-run (that is, with the levels of the indices), whereas the informality of property rights is also significant and negative. Shorter-run movements, however, seem to only correlate robustly (and negatively) in the case of economic dynamism and the informality of property. This is in line with the general idea that the security of property rights is a fundamental determinant of good socioeconomic outcomes (Besley & Ghatak, 2010).

Table 9: Economic dynamism and inclusion in Colombia, 2005-2010

	Economic Institutions								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Growth in economic...						Average level of economic...		
	Dynamism				Inclusion		Dynamism		Inclusion
	Index		Night lights		Index		Index	Night lights	Index
Panel A. "Levels model" (Initial violence)									
Dynamism index 2005		-0.205***							
		(0.0347)							
Night lights 2005				-0.0990***					
				(0.0152)					
Inclusion 2005						-0.152***			
						(0.0183)			
Open Government Index IGA	0.00295	0.00624***	2.14E-05	0.000891	-0.000380	0.00194	0.0175***	0.0130***	0.0150***
	(0.00182)	(0.00194)	(0.000929)	(0.000939)	(0.00133)	(0.00136)	(0.00240)	(0.00302)	(0.00285)
Lands informality rate	0.398	-2.072**	-1.772***	-2.885***	3.978***	1.641**	-11.84***	-17.47***	-13.34***
	(0.820)	(0.806)	(0.422)	(0.484)	(0.702)	(0.750)	(1.031)	(1.226)	(1.345)
Constant	-0.156*	-0.282***	0.0280	0.0828*	-0.0472	-0.126*	-0.693***	-0.371**	-0.539***
	(0.0941)	(0.0969)	(0.0481)	(0.0479)	(0.0729)	(0.0729)	(0.121)	(0.161)	(0.157)
Observations	838	838	838	838	742	742	838	838	742
R-squared	0.006	0.141	0.014	0.057	0.041	0.125	0.182	0.161	0.180

Notes: Estimation sample includes all types of territories: Rural, Rural-urban, Urban and Metropolitan. Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

In Table 10 we move from economic to political institutions. When looking at the levels, correlations between the political determinants and performance are not very robust (or intuitive), which possibly reflects omitted factors explaining these correlations. The regressions for changes in these political determinants are more intuitive, in particular with increases in corrupt or clientelistic votes being correlated with poorer economic dynamism performance. As discussed for the Colombian case in Fergusson et al. (2019), this falls in line with the preponderance of the literature on clientelism, which highlights that these practices hurt democracy and development. Politicians focus on providing particularistic benefits for powerful minorities rather than public goods that increase the general welfare and productivity (Bates, 1981; Kitschelt, 2000; Stokes, 2005, 2007). Moreover, since immediate material benefits may be especially pressing for vulnerable voters, clientelism also creates incentives to trap voters in these relationships keeping them poor and dependent (Bobonis et al., 2017). Finally, by relying on public funds for the reproduction of the clientelistic network, clientelism can also incentivize arbitrary and costly rules of redistribution and corruption in the public sector (Stokes et al., 2013; Maiz & Requejo, 2001; Singer, 2009).

Table 10: Economic dynamism and inclusion in Colombia, 2005-2010

	Political institutions								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Growth in economic...						Average level of economic...		
	Dynamism				Inclusion		Dynamism		Inclusion
	Index		Night lights		Index		Index	Night lights	Index
Panel A. "Levels model" (Initial political equilibrium)									
Dynamism index 2005		-0.166***							
		(0.0322)							
Night lights 2005				-0.0837***					
				(0.0139)					
Inclusion 2005						-0.148***			
						(0.0169)			
Judges per capita 2005	0.00331**	0.00331***	-0.00190*	-0.00213**	-0.00718***	-0.00487***	0.00166	-0.00507*	0.0121***
	(0.00133)	(0.00127)	(0.00108)	(0.00108)	(0.00161)	(0.00157)	(0.00211)	(0.00276)	(0.00281)
Parapolitician votes 2006	0.0459	0.0397	0.0839**	0.0972**	-0.186***	-0.198***	-0.0148	0.276**	-0.174
	(0.0543)	(0.0532)	(0.0426)	(0.0420)	(0.0549)	(0.0517)	(0.0958)	(0.120)	(0.109)
Personal vote in House 2006	-0.104	-0.00120	0.0807**	0.159***	-0.259***	-0.0468	0.568***	1.414***	1.307***
	(0.114)	(0.125)	(0.0393)	(0.0434)	(0.0708)	(0.0697)	(0.149)	(0.119)	(0.124)
Personal vote in Senate 2006	0.454*	0.303	-0.0547	-0.0640	-0.210	-0.334*	-0.686	-0.192	-0.944*
	(0.236)	(0.211)	(0.121)	(0.127)	(0.214)	(0.191)	(0.435)	(0.486)	(0.490)
Constant	-0.369*	-0.319**	-0.0353	-0.0257	0.564***	0.478***	0.118	-1.050***	-0.304
	(0.201)	(0.161)	(0.0902)	(0.0931)	(0.154)	(0.142)	(0.341)	(0.356)	(0.371)
Observations	837	837	837	837	741	741	837	837	741
R-squared	0.014	0.117	0.013	0.046	0.072	0.155	0.021	0.101	0.140
Panel B. "Acceleration model" (Changes in political equilibrium)									
Dynamism index 2005		-0.188***							
		(0.0321)							
Night lights 2005				-0.0910***					
				(0.0136)					
Inclusion 2005						-0.132***			
						(0.0177)			
Parapolitician votes 2006-2014	-0.00938***	-0.0132***	-0.0136***	-0.0154***	0.00252	0.00109	-0.0248***	-0.0358***	-0.00961
	(0.00314)	(0.00306)	(0.00371)	(0.00366)	(0.00371)	(0.00372)	(0.00421)	(0.00680)	(0.00856)
Personal vote in House 2006-	0.00189	7.90E-05	-0.00242***	-0.00358***	0.00232	0.000887	-0.00871***	-0.0201***	-0.00971***
	(0.00261)	(0.00266)	(0.000862)	(0.00101)	(0.00170)	(0.00133)	(0.00200)	(0.00368)	(0.00311)
Personal vote in Senate 2006-	-0.229***	-0.374***	-0.236***	-0.274***	0.579***	0.347***	-0.883***	-0.742***	-1.472***
	(0.0810)	(0.0841)	(0.0496)	(0.0509)	(0.0833)	(0.0851)	(0.136)	(0.172)	(0.153)
Constant	-0.0248	-0.0380**	-0.0193*	0.0524***	0.0640***	0.0388**	-0.0825***	-0.0487	-0.159***
	(0.0169)	(0.0160)	(0.0109)	(0.0156)	(0.0166)	(0.0168)	(0.0275)	(0.0375)	(0.0318)
Observations	837	837	837	837	741	741	837	837	741
R-squared	0.018	0.146	0.053	0.093	0.076	0.141	0.072	0.066	0.132

Notes: Estimation sample includes all types of territories: Rural, Rural-urban, Urban and Metropolitan. Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

Finally, Table 11 looks at the very long run. In this case we only examine levels on levels, given the nature of the determinants, which are long-run influences rather than key aspects for the shorter-run responses. Confirming the descriptions above and the literature on the persistence of Colombian regional development and in-

equality, historical measures of the presence of the state, particularly the presence of a colonial *estanco* or *alcabala* and public officials in 1794 correlate with current performance, especially with economic dynamism.

Table 11: Economic dynamism and inclusion in Colombia, 2005-2010

	Longer-run determinants		
	(1)	(2)	(3)
Dependent variable:	Growth in economic...		
	Dynamism		Inclusion
	Index	Night lights	Index
Alcabala	-0.227*	-0.140	0.216
	(0.118)	(0.152)	(0.159)
Mail	0.129	0.0520	0.126
	(0.135)	(0.172)	(0.139)
Aguardiente	0.536***	0.551***	0.229***
	(0.112)	(0.116)	(0.0751)
Local level FT employees 1995	6.26E-05	8.04E-06	-0.000121***
	-5.06E-05	-7.20E-05	(4.29e-05)
Government officials 1794	0.00229***	-0.00108	0.00809***
	(0.000665)	(0.00136)	(0.00108)
Public officials 1918	0.000137	0.000255	0.00012
	(0.000118)	(0.000186)	(0.00016)
Informality of property rights	-14.83***	-21.10***	-15.19***
	(1.194)	(1.359)	(1.427)
Slavery 1843 TF	2.555***	3.402**	-1.240
	(0.936)	(1.318)	(0.942)
Constant	0.226***	0.294***	0.218***
	(0.0455)	(0.0572)	(0.0466)
Observations	791	791	699
R-squared	0.215	0.208	0.196

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05 *p<0.1

5. Conclusions

We have described the patterns of economic growth and social progress in Colombian functional territories, constructed so that they can reflect the patterns of spatial agglomeration and economic interactions in a territory better than simple administrative divisions. Our analysis reveals, with a new lens, one old concern of economic historians in Colombia (see for instance Safford & Palacios, 2002): the persistent and significant economic, social, and political fragmentation of the territory. Our focus is on economic interactions, relying on a novel characterization of functional territories which measures the expansion of urban activities beyond urban agglomerations into rural areas and the linkages between urban and rural areas. The significant fragmentation of economic interactions is confirmed with the persistence of many strictly rural municipalities (close to 66% of the total) that hold a non-negligible share of the population (close to 20%) and have no detectable links to neighboring areas.

Perhaps more concerning, when we describe the economic performance and social progress of these territories, both the inputs needed to attain good outcomes and the outcomes themselves show a clear difference with larger and more urbanized agglomerations exhibiting important advantages. Moreover, the persistence of the divide is again confirmed by the fact that long-run institutional determinants best help to differentiate the types of territories and that, while more dynamic places tend to be the more inclusive ones, recent improvements in dynamism do not correlate with improvements in inclusion.

Taken together, these findings invite further endeavors to understand the key causes of the limited extent of economic integration and lack of convergence in outcomes. They also suggest that policies should explicitly help isolated regions to increase their level of economic connectedness to the rest of the country.

References

Acemoglu, D., Garcia-Jimeno, C., & Robinson, J. A. (2015). State capacity and economic development: a network approach. *American Economic Review, 105*(8), 2364-2409.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. *Handbook of economic growth, 1*, 385–472.

Amior, M., & Manning, A. (2015). The persistence of local joblessness. CEP Discussion Paper; no. 1357. https://core.ac.uk/download/pdf/35435854.pdf

Angrist, J. D., & Pischke, J. S. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton, Estados Unidos: Princeton University Press.

Autor, D. H., & Dorn, D. (2013). The growth of low-skill service jobs and the polarization of the us labor market. *The American Economic Review, 103*(5), 1553–1597.

Autor, D. H., Dorn, D., & Hanson, G. H. (2013). The China syndrome: Local labor market effects of import competition in the United States. *The American Economic Review, 103*(6), 2121– 2168.

Banerjee, A. V., & Duflo, E. (2003). Inequality and growth: What can the data say? *Journal of economic growth, 8*(3), 267–299.

Barca, F. (2010). *An agenda for a reformed cohesion policy: a place-based approach to meeting our challenges and expectations*. Independent report prepared at the request of Danuta Hübner, Commissioner for Regional Policy of the European Commission.

Barrera-Osorio, F., Maldonado, D., Rodríguez, C., (2012). *Calidad de la educación básica y media en colombia: diagnóstico y propuestas* (Tech. Rep.). https://repository.urosario.edu.co/bitstream/handle/10336/10907/10078.pdf

Bates, R. (1981). *Markets and states in tropical Africa: the political basis of agricultural policies*. Berkeley, Estados Unidos: University of California Press.

Benabou, R. (1996). Inequality and growth. *NBER macroeconomics annual, 11*, 11–74.

Berdegué, J., Jara, B., Fuentealba, R., Toha,´ J., Modrego, F., Schejtman, A. and Bro, N. (2011). Territorios funcionales en chile. Documento de trabajo, 102.

Berdegué, J., Hiller, T., Ramírez, J. M., Satizábal, S., Soloaga, I., Soto, J., Uribe, M. & Vargas, M. (2017). *Delineating functional territories from outer space* (Tech. Rep.).

Besley, T., & Ghatak, M. (2010). Property rights and economic development. In V, D. Rodrik and M. Rosenzweig (Eds.), *Handbook of development economics Volume 5* (pp. 4525–4595). Elsevier- North-Holland.

Bobonis, G. J., Gertler, P., Gonzalez-Navarro, M., & Nichter, S. (2017). *Vulnerability and clientelism* (NBER Working Paper No. 23589). National Bureau of Economic Research website: https://www.nber.org/papers/w23589

Bonet-Morón, J., & Ayala-García, J. (2016, May). *La brecha fiscal territorial en Colombia* (Documentos de trabajo Sobre Economa Regional Y Urbana No. 014561). Banco de la República website: https://ideas.repec.org/p/col/000102/014561.html

Brown, L. A., & Holmes, J. (1971). The delimitation of functional regions, nodal regions, and hierarchies by functional distance approaches. *Journal of Regional Science, 11*(1), 57–72.

Casey, K., Glennerster, R., & Miguel, E. (2012). Reshaping institutions: Evidence on aid impacts using a preanalysis plan. *The Quarterly Journal of Economics, 127*(4), 1755–1812.

Chien, S., & Ravallion, M. (2001). How did the world's poorest fare in the 1990s? *Review of Income and wealth, 47*(3), 283–300.

Coombes, M. G., Green, A. E., & Openshaw, S. (1986). An efficient algorithm to generate official statistical reporting areas: the case of the 1984 travel-to-work areas revision in Britain. *Journal of the operational research society, 37*(10), 943–953.

Coombes, M. G., & Openshaw, S. (1982). The use and definition of travel-to-work areas in Great Britain: some comments. *Regional Studies 16*(2), 141-149.

Corts, D., & Vargas, J. F. (2012). *Inequidad regional en colombia* (Documentos Cede). https://repository.urosario.edu.co/bitstream/handle/10336/10980/10081.pdf

Coscia, M., Cheston, T., & Hausmann, R. (2017). Institutions vs. social interactions in driving economic convergence: *Evidence from Colombia* (HKS Working Paper No. RWP14-014). SSRN website: https://ssrn.com/abstract=2939678

Currie, J., & Hyson, R. (1999). Is the impact of health shocks cushioned by socioeconomic status? the case of low birthweight. *American Economic Review, 89*(2), 245–250.

Currie, J., & Moretti, E. (2007). Biology as destiny? short-and long-run determinants of intergenerational transmission of birth weight. *Journal of Labor economics, 25*(2), 231–264.

Dollar, D., & Kraay, A. (2002). Growth is good for the poor. *Journal of economic growth, 7*(3), 195–225.

Donaldson, D., & Storeygard, A. (2016). Big grids: Applications of remote sensing in economics. forthcoming, JEP.

Duranton, G. (2015). Roads and trade in Colombia. Economics of Transportation, 4(1-2), 16–36. Faguet, J.-P., & Sanchez, F. (2008). Decentralization's effects on educational outcomes in Bolivia and Colombia. *World Development, 36*(7), 1294–1316.

Fan, S., Hazell, P., & Thorat, S. (2000). Government spending, growth and poverty in rural India *American journal of agricultural economics, 82*(4), 1038–1051.

Fergusson, L. (2017). *Who wants violence? the political economy of conflict and state building in Colombia* (Documentos Cede No. 2017-67). SSRN website: https://ssrn.com/abstract=3086230

Fergusson, L., Molina, C., & Riaño, J. F. (2019). Consumers as "vat" evaders: Incidence, social bias, and correlates in Colombia. *Economia, 19*(2), 21-67.

Fergusson, L., Molina, C., & Riaño, J. F. (2018). I sell my vote, and so what? incidence, social bias, and correlates of clientelism in Colombia. *Economia, 19*(1), 181-218.

Fergusson, L., Molina, C., & Robinson, J. (2017). *The vicious circle of clientelism and state weakness*. (Unpublished manuscript)

Fergusson, L., Molina, C., Robinson, J. A., & Vargas, J. F. (2017). *The long shadow of the past: Political economy of regional inequality in Colombia* (Documentos Cede No. 2017-22). SSRN website: https://ssrn.com/abstract=2932228

Fergusson, L., Vargas, J. F., & Vela, M. A. (2013). *Sunlight disinfects? Free media in weak democracies* (Documentos Cede No. 2013-14). SSRN website: https://ssrn.com/abstract=2229506

Fox, K. A., & Kumar, T. K. (1965). The functional economic area: delineation and implications for economic analysis and policy. *Papers in Regional Science, 15*(1), 57–85.

Galvis, L. A., & Roca, A. M. (2010). *Persistencia de las desigualdades regionales en Colombia: Un análisis espacial* (Documentos de trabajo sobre Economa Regional y Urbana No. 120). Banco de la Republica de Colombia website: http://repositorio.banrep.gov.co/bitstream/handle/20.500.12134/3014/dtser_120.pdf?sequence=1&isAllowed=y

Gamboa, L., & Londoño, E. (2014). Assessing educational unfair inequalities at a regional level in Colombia. *Revista Lecturas de Economía 83*, 97-133.

Gao, T. (2004). Regional industrial growth: evidence from Chinese industries. *Regional Science and Urban Economics, 34*(1), 101–124.

Gelman, A. (2011). Causality and statistical learning. *American Journal of Sociology*, 117(3), 955–966.

Glewwe, P. W., Hanushek, E. A., Humpage, S. D., & Ravina, R. (2011, October). *School resources and educational outcomes in developing countries: A review of the literature from 1990 to 2010* (NBER Working Papers No. 17554). National Bureau of Economic Research website: http://ideas.repec.org/p/nbr/nberwo/17554.html

Green, D. P., Ha, S. E., & Bullock, J. G. (2010). Enough already about "black box" experiments: Studying mediation is more difficult than most scholars

suppose. *The Annals of the American Academy of Political and Social Science, 628*(1), 200–208.

Haughton, J., & Khandker, S. R. (2009). *Handbook on poverty + inequality*. World Bank Publications.

Henderson, J. V., Storeygard, A., & Weil, D. N. (2012). Measuring economic growth from outer space. *American economic review, 102*(2), 994–1028.

Hodler, R., & Raschky, P. A. (2014). Regional favoritism. *The Quarterly Journal of Economics, 129*(2), 995–1033.

Holm-Nielsen, L., Laverde, M., Blom, A., & de Pietro-Jurand, R. (2003). *Tertiary education in Colombia: Paving the way for reform*. The World Bank. Retrieved from https://doi.org/10.1596/978-0-8213-5466-7

Jones, C. (2017). Spatial economy and the geography of functional economic areas. *Environment and Planning B: Urban Analytics and City Science, 44*(3), 486–503.

Kitschelt, H. (2000). Linkages between citizens and politicians in democratic politics. *Comparative Political Studies, 33*(6-7), 845-79.

Kulkarni, R., Haynes, K., Stough, R., & Riggle, J. (2011). *Revisiting night lights as proxy for economic growth: A multi-year light-based growth indicator (lbgi) for China, India and the US* (GMU School of Public Policy Research Paper, 2011-12). SSRN website: https://ssrn.com/abstract=1777546

Maiz, R., & Requejo, R. (2001). Clientelism as a political incentive structure for corruption. *Spring Conference of the European Consortium for Political Research*. Grenoble, France.

Martınez, L. R. (2016). *Sources of revenue and government performance: Evidence from colom-bia*. Unpublished Manuscript. Draft available from https://sites. google. com/site/lrmartineza.

Modrego, F., & Berdegué J. (2015). A large-scale mapping of territorial development dynamics in latin america. *World Development, 73*, 11–31.

Naudé, W., Gries, T., Wood, E., & Meintjies, A. (2008). Regional determinants of entrepreneurial start-ups in a developing country. *Entrepreneurship and Regional Development, 20*(2), 111– 124.

OECD. (2002). *Redefining territories, the functional regions*. Paris, France: Organization for Economic Co-operation and Development.

Pachon, A., & Ramírez, M. T. (2006). *La infraestructura de transporte en Colombia durante el siglo XX*. Fondo de Cultura Económica.

Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1994). *Making democracy work: civic traditions in modern Italy*. Princeton University Press.

Ravallion, M. (2014). Income inequality in the developing world. *Science, 344*(6186), 851–855.

Robinson, J. A. (2016). La miseria en Colombia. *Revista Desarrollo y Sociedad, 76*, 9–88.

Safford, F., & Palacios, M. (2002). *Colombia: país fragmentado, sociedad dividida*. Norma.

Singer, M. (2009). *Buying voters with dirty money: The relationship between clientelism and corruption* (APSA 2009 Toronto Meeting Paper). SSRN website: https://ssrn.com/abstract=1449001

Srinivasan, T. (2001). *Growth and poverty alleviation: lessons from development experience* (Tech. Rep.). ADBI Research Paper Series.

Srinivasan, T. N., & Bhagwati, J. (2001). Outward-orientation and development: are revisionists right? In D. Lal & R. H. Snape (Eds.), *Trade, development and political economy* (pp. 3–26). Palgrave Macmillan.

Stokes, S. (2005). Perverse accountability: a formal model of machine politics with evidence from Argentina. *American Political Science Review, 99*(3), 315-25.

Stokes, S. (2007). Political clientelism. In C. Boix & S. Stokes (Eds.), *Oxford handbook of comparative politics* (pp. 604-27). Oxford University Press.

Stokes, S., Dunning, T., Nazareno, M., & Brusco, V. (2013). *Brokers, voters, and clientelism: the puzzle of distributive politics*. Cambridge University Press.

Storper, M. (1997). *The regional world: territorial development in a global economy*. Guilford press.

Tolbert, C. M., et al. (1987). *Labor market areas for the United States* (Report for Economic Research Service-USDA).

Tolbert, C. M., & Sizer, M. (1996). *US commuting zones and labor market areas: A 1990 update* (Report for Economic Research Service-USDA).

Tomaney, J., Pike, A., & Rodriques-Pose, A. (2011). Local and regional development. In A. Pike, A. Rodríguez-Pose & J. Tomaney (Eds.), *Handbook of Local and Regional Development* (pp. 618–630). http://www.regscience.hu:88/record/418/files/DEMO-BOOK-2017-055.pdf#page=641

Villegas, M. G., & Restrepo, J. R. E. (2013). *El derecho al estado: los efectos legales del apartheid institucional en colombia* (Bogotá: Centro de Estudios de Derecho, Justicia y Sociedad).

Watkins, M. H. (1963). A staple theory of economic growth. *Canadian Journal of Economics and Political Science/Revue canadienne de economiques et science politique, 29*(2), 141–158.

A Appendix Tables

Table A-1: Variable description and sources

Variable	Description	Source
Dynamism index, 2005 and 2010	Average of territorial standardized night lights and per capita tax revenue	
Night lights, 2005 and 2010	Total light intensity (sum of all light pixels in each territory) divided by total area (sum of the area of all icipalities in the territory) in km2. We take the log of (1 plus) given a very skewed distribution in levels (and to allow for some territories with zero light). Finally we standardize each year for regressions and for the dynamism index.	Defense Meteorological Satellite Program's Operational Linescan System (DMSP-OLS)
Tax Revenue per capita, 2005 and 2010	Total tax revenue by territory (in 2010 pesos) divided by population. We take the log of (1 plus) the ratio and standardize for the dynamism index.	National Planning Department, DNP
Inclusion index, 2005 and 2010	Average of territorial standardized child mortality, proportion of people in Sisben 1 category (poor), and share of low-weight births	
Child mortality rate, 2005 and 2010	Standardized weighted average (by population) of child mortality rate for municipalities in the territory.	National Statistical Institute, DANE
Share in Sisben 1, 2005 and 2010	Standardized population share in Sisben category 1 in the territory. The System of Beneficiary Selection (also known as Census of the Poor) assigns a poverty index for each family to identify the poorest. Category 1 is the poorest tier.	Census of the poor, SISBEN
Share of low-weight births, 2005 and 2010	Standardized share of births that are in low weight (2,499 grams or less, regardless of gestional age) in the territory	Vital Statistics, National Statistical Institute, DANE
Geography		
Land aptitude index	Derived from an index of soil aptitude where 1 is the most suitable and level 8 the lest suitable (inverted to ease interpretation), and computed as the average aptitude of solid in the territory	National Geographic Institute, IGAC
Distance to nearest city	Average Euclidean distance of municipalities in each territory to the closest metropolis (top 3 largest cities, Bogotá, Cali and Medellín)	Own estimation
Distance to nearest market	Average Euclidean distance of municipalities in each territory to the closest wholesales market	AGRONET
Distance to nearest fluvial port	Average Euclidean distance of municipalities in each territory to the closest city with fluvial port, namely, Barranquilla, Buenaventura, Cartagena and Santa Marta	Own estimation
Access to primary roads	Proportion of municipalities in territory with access to main highway network (primary roads)	Pachón and Ramírez (2006)
Education		
Primary enrollment rate, 2005 and 2010	Primary Gross Enrollment Rate. Primary Gross Enrollment Rate is the total enrollment in primary like proportion of population in territory between 6 and 11 years	SIMAT of Ministry of Education
Secondary enrollment rate, 2005 and 2010	Secondary Gross Enrollment Rate. Secondary Gross Enrollment Rate is the total enrollment in secondary like proportion of population in territory between 12 and 17 years	SIMAT of Ministry of Education
Years of schooling, 2005	Weighted average (by population) of municipal years of schooling among people older than 15 year	National Census 2005, National Statistical Institute, DANE
Saber test scores, 2005 and 2010	Weighted average (by population) of municipal scores in the official standardized tests (average from mathematics, language, social sciences, philosophy and biology).	Colombian Institute for Education and Evaluation, ICFES
Economic policies		
Saving rate, 2005 and 2010	Weighted average (by population) of municipal savings relative to current income.	National Panning Department, DNP
Investment reate, 2005 and 2010	Weighted average (by population) of municipal savings relative to current expenditure.	National Panning Department, DNP

Economic institutions		
Informality of property rights	Proportion of land without a title or registration. Average from 2000 to 2006	National Geographic Institute Agust´ın Codazzi, IGAC
Open Government Index IGA	Weighted average (by population) of municipal index in the territory. IGA Index is a synthetic indicator that measures the performance of strategic anti-corruption standards according to the following 24 indicators grouped in eight categories: (i) Internal control: Standard Model of Internal Control (MECI), Internal Accounting Control; (ii) Document management: Law of Archives; (iii) Recruitment: Annual Procurement Plan, Contract Publishing; (iv) Territorial core competences: Single Information System (SUI), Social Programs (SISBEN), Integrated License System, Hospital Information System (SIHO); (v) Administrative and financial management systems: Unique Territorial Form (FUT), Royalties, Budget Execution System (SICEP), Public Employment Information and Management System (SIGEP), Information and Asset Management System (SIGA); (vi) Transparency and accountability: SICEP Anti-corruption, SICEP Risk Map, SICEP Control and follow up, SICEP Accountability; (vii) SICEP Citizen Support; (viii) Electronic government capacity: GEL Open Government, GEL Services, SICEP Open Data, SICEP Advertising, Unique Procedures Information System (SUIT). For a more detailed explanation of the indicators, please visit: https:// www.procuraduria.gov.co/portal/indicadores IGA.page	Procuraduría General (Inspector General)
Political institutions/political equilibrium		
Judges per capita, 2005	Weighted average (by population) of municipal judges per 100.000 inhabitants.	Villegas and R. (2013)
Parapolitician votes in 2006 and 2014	Total votes for parapolitician candidates for Senate in a territory relative total votes. Parapoliticians are identified from news reports.	Fergusson et al. (2013)
Personal vote	Personal vote Share of votes in Senate or House race for specific candidates, as opposed to party list	Fergusson, Molina, and Robinson (2017)
Violence		
Coca cultivation in 2005 and 2010	Proportion of area in territory with Cocaine cultivation. Total area is computed by adding all municipalities' area in each territory.	Integrated Monitoring System of Illicit Cultivation SIMCI
Internally displaced persons	Per capita average number of forcefully displaced people between 1984 and 2005/2010 in territory.	Registro Único de Víctimas (RUV)
Homicide rate in 2005 and 2010	Per capita average number of homicides displaced people between 1997 and 2005/2010 in territory.	Registro Único de Víctimas (RUV)
Terrorist Attacks in 2005 and 2010	Per capita average number of terrorist attacks between 1997 and 2005/2010 in territory.	Registro Único de Víctimas (RUV)
Longer-run determinants		
Alcabala	Proportion of municipalities in each territory that had alcabala in 1794	Duran and Díaz (1794)
Maik	Proportion of municipalities in each territory that had post in 1794	Duran and Díaz (1794)
Aguardiente	Proportion of municipalities in each territory that had an aguardiente or gunpowder estanco in 1794	Duran and Díaz (1794)
Government officials in 1794	Government officials per municipality as reported by Durán and Díaz. The variable is shown as the residuals conditional on total population and department fixed effects.	Duran and Díaz (1794)
Public officials in 1918	Logarithm of the number of public officials in 1918 plus one (since some municipalities have zero). The variable is shown as the residuals conditional on total population and department fixed effects.	1918 National Census